TITLE II—RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

Explanation of tables

The following tables provide the program-level detailed guidance for the funding authorized in title II of this Act. The tables also display the funding requested by the administration in the fiscal year 2005 budget request for research, development, test and evaluation programs, and indicate those programs for which the committee either increased or decreased the requested amounts. As in the past, the administration may not exceed the authorized amounts (as set forth in the tables or, if unchanged from the administration request, as set forth in budget justification documents of the Department of Defense) without a reprogramming action in accordance with established procedures. Unless noted in this report, funding changes to the budget request are made without prejudice.

NATIONAL DEFENSE AUTHORIZATION FOR FISCAL YEAR 2005
(Dollars in Thousands)

Title II – RESEARCH, DEVELOPMENT, TEST & EVALUATION	Authorization Request	Senate Change	Senate Authorized
Research, Development, Test & Evaluation, Army	9,266,258	420,700	9,686,958
Research, Development, Test & Evaluation, Navy	16,346,391	333,000	16,679,391
Research, Development, Test & Evaluation, Air Force	21,114,667	149,600	21,264,267
Research, Development, Test & Evaluation, Defense-wide	20,739,837	-103,900	20,635,937
Operational Test & Evaluation	305,135	4,000	309,135
TOTAL RDT&E	**67,772,288**	**803,400**	**68,575,688**

Subtitle A—Authorization of Appropriations

Science and technology

The committee commends the Department of Defense for its commitment to the importance of science and technology (S&T) programs. The Science and Technology Program budget request has increased by 22 percent over the last three fiscal years, keeping pace with the overall increased investment in defense spending. However, at $10.55 billion, or 2.62 percent of the overall Department's budget, the request falls short of the Department's stated goal of three percent of total funding for S&T. The committee urges the Department to increase its efforts to meet this important goal for its long-range programs.

The Department faces pressing and competing priorities and challenging operational requirements. In confronting, adapting to, and surmounting these challenges, which are represented by unexpected low- and high-tech threats, interoperability of new capabilities, such as unmanned systems and coalition forces, and rapid response demands, the Department's S&T investment remains a key transformational enabler.

As has been demonstrated in recent operations, stable long-term investments in basic and applied research have led to critical force protection technologies, stand off sensing and detection capabilities, and improved, precision lethality. Future technological innovations resulting from basic research and scientific endeavors, as well as rapid transition and adaptation of old capabilities in new ways, will ensure the continued technological superiority of the U.S. military. The committee recommends an increase of over $445 million for S&T programs, including an increase of: approximately $40 million in projects designed to combat terrorism; over $30 million toward development of future weapons systems; almost $70 million for unmanned systems; and approximately $100 million for the future force and force protection.

The committee supports the Department's efforts to recruit and retain scientists and engineers (S&E) in national security critical disciplines, such as ocean acoustics, hypervelocity physics, energetics, propulsion, and adaptive optics, and has provided authorization for a pilot program to further the Department's S&E workforce goals.

The committee remains concerned with the increasingly near-term, applied nature of the S&T program and recommends a renewed focus on the kind of discovery-oriented research, informed by the military mission, that has yielded tangible benefits for today's warfighter. The committee recommends an increase of approximately $80 million in these fundamental research programs.

It is the courage and commitment of our soldiers, sailors, airmen, and marines that make the U.S. military the finest fighting force in the world. When that courage and commitment is coupled with the finest technology America's scientists and engineers have to offer, the effectiveness of America's warfighter is dramatically increased.

Subtitle B—Program Requirements, Restrictions, and Limitations

DD(X) destroyer (sec. 211)

The committee recommends a provision that would authorize the Secretary of the Navy to fund the second destroyer of the DD(X)-class with Research, Development, Test, and Evaluation, Navy (RDTE, N), funds, and would direct that $99.4 million be authorized for the detail design of that second ship.

The Committee on Armed Services of the Senate, in its report (S. Rept. 108–46) to accompany the National Defense Authorization Act for Fiscal Year 2004, directed the Secretary of the Navy to provide a report on the viability of the surface combatant industrial base, with specific focus on the transition from the DDG–51 *Arleigh Burke*-class destroyers to the DD(X). This report was delivered to the congressional defense committees in March 2004. The report included a workload analysis that showed that if the DD(X) schedule slips, the shipyard that is scheduled to build the follow ship, the second destroyer of the DD(X)-class, could experience significant workload issues which, depending on the length of the schedule slip, could affect the financial viability of the this shipyard. This is exacerbated by the fact that this shipyard's workload and resultant viability is solely dependent on the design and construction of surface combatants.

The committee remains concerned about the viability of the competitive industrial base for the design and construction of surface combatants for the Navy. According to the Future Years Defense Program (FYDP), there will be no surface combatants in the budget request for fiscal year 2006. The budget request for fiscal year 2005 includes $3.5 billion for the construction of the last three DDG–51 *Arleigh Burke*-class destroyers, bringing the inventory to 62 of these multi-mission ships. The next class of destroyers will use the DD(X) design. The first of these ships is being funded with incremental RDTE,N funding starting with $221.1 million of construction money in fiscal year 2005. If the current schedule is maintained, the contract for the second ship of the DD(X)-class will not be awarded for about eighteen months, and is expected in fiscal year 2007 using Shipbuilding and Conversion, Navy (SCN), funding. This gap could jeopardize the design and production capability of the shipyard scheduled for the second ship.

The Navy had originally planned to compete the construction phase of the first DD(X), but recently made a decision to award that contract on a sole-source basis to the shipyard with lead design responsibility. The committee expects the Navy to take all actions necessary to ensure the viability of the second shipyard in order to maintain a healthy and competitive industrial base for surface combatants. The committee believes that the Navy is responsible for ensuring that both shipyards share equitably in the DD(X) design effort from this point forward to facilitate a smooth transition from design to fabrication to construction of DD(X).

The committee believes that if the flexibility provided by using RDTE,N funds for the lead ship at the lead shipyard is justified, that same flexibility is necessary for the follow ship at the second shipyard as well.

The budget request included $1.4 billion in PE 64300N for DD(X) total ship engineering. The committee recommends an increase of $99.4 million in PE 64300N to accelerate design efforts at the follow shipyard for the second DD(X)-class destroyer, for the purpose of sustaining a competitive industrial base for surface combatant ships.

Global Positioning System III (sec. 212)

The committee recommends a provision that would prohibit obligation or expenditure of more than 80 percent of the amount authorized for appropriation in this Act for the Global Positioning System III (GPS III) until the Secretary of Defense: (1) completes an analysis of alternatives for next-generation GPS capabilities; and (2) provides a report to the congressional defense committees that assesses the results of this investigation.

The committee understands that GPS capabilities are critical to military navigation, precision munitions and other military applications, and recognizes that jamming of GPS signals by U.S. adversaries is a serious concern. The committee notes that the Air Force is planning to develop and acquire next generation GPS III satellites to address jamming threats and to improve geolocational accuracy. Current Air Force planning indicates that GPS III will be a large satellite with a directional antenna and sufficient power to overcome most jamming signals and satellite crosslinks that will allow improved accuracy.

The committee believes that the GPS operational control segment, user equipment and networking techniques could also be effective in overcoming jamming and improving system accuracy. The committee believes that a thorough investigation of tactics, techniques and procedures, and alternative architectures and technologies is justified before proceeding with detailed design work on the GPS III satellite.

Initiation of concept demonstration of Global Hawk high altitude endurance unmanned aerial vehicle (sec. 213)

The committee recommends a provision that would amend section 221 of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Public Law 106–398), by changing the date by which the Secretary of Defense is to initiate the demonstration of the Global Hawk high altitude endurance unmanned aerial vehicle (HAE UAV) from March 1, 2001 to March 1, 2005.

Section 221 of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Public Law 106–398) directed that the Air Force use available non-developmental technology on a Global Hawk to demonstrate its operational viability in an airborne air surveillance role in the Southern Command (SOUTHCOM) area of responsibility (AOR). The purpose of this demonstration was to determine whether the Global Hawk HAE UAV, operated by SOUTHCOM, could alleviate the operational demands on the fleet of E–3A Airborne Warning and Control (AWACS) aircraft in the counter-drug air surveillance mission. The Senate Report (S. Rept. 106–292) to accompany its version of the bill stated that the Air Force should acquire and integrate a non-developmental, active electronically scanned array (AESA) radar for this purpose. Subse-

quently, the Air Force suggested that algorithms be developed in the existing ground moving target indicator (GMTI) that would give the vehicle an air surveillance capability as an airborne moving target indicator (AMTI). The committee was satisfied with this technical approach.

The committee is aware that world events dictated the use of developmental Global Hawk HAE UAVs in Operation Enduring Freedom and Operation Iraqi Freedom. Shortages in sensor packages became a problem with losses of several Global Hawk HAE UAVs during developmental testing and during Operation Enduring Freedom.

The committee received a letter from the Air Force in January 2004, stating that the Air Force planned to execute the demonstration in the spring of 2004, but without the Airborne Moving Target Indicator (AMTI) mode integrated into the sensor, which would impact the program of record. The Air Force assumes this would meet the intent of the legislation. The committee disagrees. The intent of the legislation continues to be to ascertain the feasibility of the Global Hawk HAE UAV in an airborne air surveillance mode, with an objective of reducing dependance on the high-demand, low-density AWACS fleet for counter-drug operations in the SOUTHCOM AOR.

Joint unmanned combat air systems program (sec. 214)

The committee recommends a provision that would establish an executive committee to provide guidance and recommendations to the joint unmanned combat air systems (J–UCAS) program office in the Defense Advanced Research Projects Agency (DARPA). The budget request included $284.6 million in PE 63400D8Z and $422.9 million in PE 64400D8Z for J–UCAS. The J–UCAS program is a consolidation of what had been two individual unmanned combat air vehicle (UCAV) programs in the Navy and the Air Force, managed by their respective Services. Management responsibility for J–UCAS has been assigned to DARPA.

In testimony before the AirLand Subcommittee of the Committee on Armed Services of the Senate on March 24, 2004, the Assistant Secretary of the Navy for Research, Development, and Acquisition, and the Assistant Secretary of the Air Force for Acquisition indicated that they did not have substantial insight into or oversight over this important program since the change in management. The committee is concerned that the lack of high-level participation from the Service's acquisition and requirements officials will result in a product that will not be considered cost-effective when ready for transition back to the Services. The J–UCAS program plan is to have vehicles ready for operational assessments between fiscal years 2007 and 2009.

The executive committee established by this provision would ensure the necessary high-level Service participation in this important program. The provision provides that the Undersecretary of Defense for Acquisition, Technology, and Logistics will chair the executive committee. The provision also directs that executive committee membership will consist of the following individuals, at a minimum: (1) the Assistant Secretary of the Navy for Research, Development, and Acquisition; (2) the Assistant Secretary of the

Air Force for Acquisition; (3) the Deputy Chief of Naval Operations for Warfare Requirements and Programs; and (4) the Deputy Chief of Staff of the Air Force for Air and Space Operations.

The Services' unique UCAV programs were structured, to a large extent, to meet the goal established in section 220 of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Public Law 106–398) that, by 2010, one-third of the aircraft in the operational deep strike force aircraft fleet would be unmanned. While consolidation of management under DARPA should provide efficiencies and increased opportunity for common operating systems, avionics, engines, sensors, and weapons, it is imperative that the Services have direct input in this program. The committee is particularly interested in ensuring that, when the operational assessments are made, it include a robust assessment of carrier suitability for naval use.

Joint strike fighter aircraft program (sec. 215)

The committee recommends a provision that would require the Secretary of Defense to direct the Defense Science Board (DSB) to conduct a study and provide a report to the congressional defense committees on the Joint Strike Fighter (JSF), concurrent with the delivery of the President's budget request for fiscal year 2006.

The committee is aware that recent design reviews indicate that all three variants of the JSF exceed the weight that is necessary to deliver the required performance. The excess weight would particularly detract from the performance of the short takeoff and vertical landing (STOVL) variant of the aircraft, causing it to fall short of several key performance parameters. The excess weight would detract from the performance of the conventional takeoff and landing (CTOL) and aircraft carrier (CV) variants to a lesser extent.

In conducting the study required by this provision, the DSB should thoroughly examine all three variants in the JSF program, and document its findings in a report. The report should include, at a minimum: (1) the current status of the JSF program; (2) the extent of the effects of the excess weight on estimated performance; (3) the validity of the technical approaches being considered to regain the required performance; (4) a risk assessment of the technical approaches being considered to regain the required performance; and (5) a list of any alternative technical approaches that might help to regain the required performance.

Joint Experimentation (sec. 216)

The committee recommends a provision that would require the Secretary of Defense to establish a separate, dedicated program element in Research, Development, Test and Evaluation, Defense-wide, for joint experimentation activities conducted by the Commander, U.S. Joint Forces Command (JFCOM). When initially established in 1998, JFCOM received most of its funding through existing Navy budget lines because the Navy assumed executive responsibility for JFCOM activities as tenant activities on Naval facilities in the Norfolk, Virginia area. Over the past seven years, the responsibilities and activities of JFCOM have grown and evolved significantly. The budget request for joint experimentation in fiscal

year 2005 is $167.6 million. The committee commends the Commander, JFCOM, for the progress achieved in developing joint concepts and capabilities, and believes that these important activities should be managed in separate, readily identifiable budget lines.

Subtitle C—Ballistic Missile Defense

Fielding of ballistic missile defense capabilities (sec. 221)

The committee recommends a provision that would authorize the use of research and development funds, authorized to be appropriated in fiscal year 2005, for the Missile Defense Agency to field an initial set of ballistic missile defense capabilities.

Patriot advanced capability-3 and medium extended air defense system (sec. 222)

The committee recommends a provision that would require approval by the Director of the Missile Defense Agency of changes to technical specifications, procurement quantities, and the development schedule for the Patriot Advanced Capability-3/Medium Extended Air Defense System (PAC–3/MEADS) combined aggregate program.

The committee recognizes that the PAC–3/MEADS system has important air and cruise missile defense missions, and that it is an essential element of the ballistic missile defense (BMD) system as well. The committee remains concerned that shifting BMD research and development from the Missile Defense Agency to the Army could inhibit the full integration of the PAC–3/MEADS capabilities into the BMD system. The committee believes that Army management of the combined program will allow coordination of the system's multiple missions. However, the committee also believes that the Director of the Missile Defense Agency must have clear visibility into program decisions that could affect the integration of the combined program into the BMD system and the ability to influence any such decisions.

Comptroller General assessments of ballistic missile defense programs (sec. 223)

The committee recommends a provision that would extend for six years the requirement for the General Accounting Office (GAO) to conduct annual assessments of the extent to which the Missile Defense Agency met its cost, scheduling, testing and performance goals, and report to Congress on the results of the assessments. The National Defense Authorization Act for Fiscal Year 2002 (Public Law 107–107) required such reports following fiscal years 2002 and 2003. This provision would require such reports following fiscal years 2004 through 2009.

Subtitle D—Other Matters

Annual report on submarine technology insertion (sec. 231)

The committee recommends a provision that would require the Secretary of Defense to submit an annual report on submarine technology insertion, concurrent with the submission of the President's budget request for fiscal years 2006, 2007, 2008, and 2009.

Section 131 of the National Defense Authorization Act for Fiscal Year 1996 (Public Law 104–106) required a similar report through fiscal year 2001. Since the expiration of that reporting requirement, the emphasis on submarine technology insertion appears to have waned.

The committee is disappointed with the limited funding allocated by the Department of Defense for submarine research and development, considering the vital contributions submarines make to national and joint operations. Exercises such as Giant Shadow, conducted in January 2003, demonstrated the potential of various technologies that could be inserted into the submarine fleet. The committee believes the Department should emphasize those submarine technologies that will reduce the production and operating cost of submarines while maintaining or improving effectiveness.

The annual report should include: (1) a list of demonstrated technologies by submarine class; (2) a plan for insertion of those demonstrated technologies by submarine class, if warranted; (3) the estimated cost of this technology insertion; (4) a list of potential technologies by submarine class; and (5) a plan for demonstration of those technologies, if warranted.

Additional Matters of Interest

Army

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
			RESEARCH, DEVELOPMENT, TEST & EVALUATION, ARMY			
2040	0601101A	1	IN-HOUSE LABORATORY INDEPENDENT RESEARCH	23,971		23,971
2040	0601102A	2	DEFENSE RESEARCH SCIENCES	131,206	11,500	142,706
			Reactive surface technology		[2,000]	
			Flexible substrates electronics		[3,000]	
			Desert terrain prediction		[2,500]	
			Low temperature research		[2,000]	
			Advanced deployable nanosensors		[2,000]	
2040	0601103A	3	UNIVERSITY RESEARCH INITIATIVES	75,133	2,000	77,133
			Anti terrorism building and construction research		[2,000]	
2040	0601104A	4	UNIVERSITY AND INDUSTRY RESEARCH CENTERS	77,658	6,000	83,658
			Nanocomposite materials research		[2,000]	
			Ferroelectric nanodevice research		[2,500]	
			Information assurance research		[1,500]	
2040	0601105A	5	FORCE HEALTH PROTECTION	9,538		9,538
2040	0602105A	6	MATERIALS TECHNOLOGY	15,385	7,500	22,885
			Advanced materials processing		[3,000]	
			Affordable multi-utility materials		[2,000]	
			Mine detection and blast mitigation		[2,500]	
2040	0602120A	7	SENSORS AND ELECTRONIC SURVIVABILITY	25,629	1,500	27,129
			Army small airship program		[1,500]	
2040	0602122A	8	TRACTOR HIP	6,627		6,627
2040	0602211A	9	AVIATION TECHNOLOGY	41,629	5,000	46,629
			Silver Fox		[5,000]	

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
2040	0602270A	10	ELECTRONIC WARFARE TECHNOLOGY	18,034		18,034
2040	0602303A	11	MISSILE TECHNOLOGY	51,993	6,000	57,993
			Hypersonic engine research		[2,000]	
			Air defense science and technology		[2,000]	
			Army flight test		[2,000]	
2040	0602307A	12	ADVANCED WEAPONS TECHNOLOGY	16,641	2,000	18,641
			Rapid target acquisition and tracking		[2,000]	
2040	0602308A	13	ADVANCED CONCEPTS AND SIMULATION	15,041	11,300	26,341
			Advanced modeling and simulation		[2,500]	
			Photonics research		[2,000]	
			Joint unmanned testing facility		[6,800]	
2040	0602601A	14	COMBAT VEHICLE AND AUTOMOTIVE TECHNOLOGY	69,638	15,500	85,138
			Advanced electric drives		[3,000]	
			Clean battlefield fuel research		[3,000]	
			Advanced energy and manufacturing technology		[3,000]	
			Advanced high power rechargeable stored energy technology		[2,000]	
			Rapid prototyping		[2,000]	
			Unmanned vehicle control technologies		[2,500]	
2040	0602618A	15	BALLISTICS TECHNOLOGY	51,301		51,301
2040	0602622A	16	CHEMICAL, SMOKE AND EQUIPMENT DEFEATING TECHNOLOGY	3,476		3,476
2040	0602623A	17	JOINT SERVICE SMALL ARMS PROGRAM	5,739		5,739

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
2040	0602624A	18	WEAPONS AND MUNITIONS TECHNOLOGY	44,666	9,000	53,666
			Micro-laminate ceramic armor		[3,000]	
			Active coating technology		[4,000]	
			Gun recoil mitigation technologies		[2,000]	
2040	0602705A	19	ELECTRONICS AND ELECTRONIC DEVICES	41,236	11,000	52,236
			Flexible display initiative		[8,000]	
			Software-defined radio research		[3,000]	
2040	0602709A	20	NIGHT VISION TECHNOLOGY	22,617		22,617
2040	0602712A	21	COUNTERMINE SYSTEMS	20,547	4,000	24,547
			Landmine detection technology		[4,000]	
2040	0602716A	22	HUMAN FACTORS ENGINEERING TECHNOLOGY	16,899		16,899
2040	0602720A	23	ENVIRONMENTAL QUALITY TECHNOLOGY	17,026		17,026
2040	0602782A	24	COMMAND, CONTROL, COMMUNICATIONS TECHNOLOGY	18,604		18,604
2040	0602783A	25	COMPUTER AND SOFTWARE TECHNOLOGY	3,982		3,982
2040	0602784A	26	MILITARY ENGINEERING TECHNOLOGY	47,152	3,000	50,152
			Geoscience and atmospheric research		[3,000]	
2040	0602785A	27	MANPOWER/PERSONNEL/TRAINING TECHNOLOGY	15,322		15,322
2040	0602786A	28	WARFIGHTER TECHNOLOGY	21,131	14,500	35,631
			Smart combat suits		[2,000]	
			Chem/bio protective garment		[2,500]	
			Advanced structures and composites		[3,000]	
			Supplemental body armor research		[7,000]	

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
2040	0602787A	29	MEDICAL TECHNOLOGY	60,877	13,200	74,077
			Fibrogen bandage development		[4,500]	
			Post traumatic stress disorder research		[2,000]	
			Non-defense research reduction		[-5,000]	
			Walter Reed Army Medical Center amputee research		[8,700]	
			Expanded anthrax research		[3,000]	
2040	0603001A	30	WARFIGHTER ADVANCED TECHNOLOGY	68,034	2,000	70,034
			Technology for human systems integration		[2,000]	
2040	0603002A	31	MEDICAL ADVANCED TECHNOLOGY	38,404	9,400	47,804
			Automatic records tracking		[2,000]	
			Wound decontamination		[3,000]	
			Electronic textiles		[3,000]	
			Digital imaging diagnosis		[1,000]	
			Non-defense research reduction		[-5,000]	
			Elastin biomatrices		[4,000]	
			Leishmaniasis		[1,400]	
2040	0603003A	32	AVIATION ADVANCED TECHNOLOGY	69,549	8,000	77,549
			Unmanned tactical combat vehicle		[8,000]	
2040	0603004A	33	WEAPONS AND MUNITIONS ADVANCED TECHNOLOGY	67,622	2,000	69,622
			Advanced penetrator munitions		[2,000]	

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
2040	0603005A	34	COMBAT VEHICLE AND AUTOMOTIVE ADVANCED TECHNOLOGY	203,126	36,200	239,326
			Electrochromic materials research		[4,000]	
			Advanced thermal management controls		[3,500]	
			Fastening and joining research		[2,000]	
			Fuel cell ground support equipment demonstration		[6,100]	
			Next generation non-tactical vehicle propulsion		[3,500]	
			Tactical vehicle design tools		[2,000]	
			Armored composite cab development		[4,000]	
			Advanced armor systems		[3,000]	
			Active protection system		[3,600]	
			Common chassis design		[1,500]	
			Cannon structure design		[3,000]	
2040	0603006A	35	COMMAND, CONTROL, COMMUNICATIONS ADVANCED TECHNOLOGY	9,946		9,946
2040	0603007A	36	MANPOWER, PERSONNEL AND TRAINING ADVANCED TECHNOLOGY	7,288	3,000	10,288
			Coordinated training		[3,000]	
2040	0603008A	37	ELECTRONIC WARFARE ADVANCED TECHNOLOGY	41,760	7,000	48,760
			Emergency response broadband system		[3,000]	
			C4 mobile service research		[2,000]	
			Missile intercept test bed		[2,000]	
2040	0603009A	38	TRACTOR HIKE	8,035		8,035
2040	0603015A	39	NEXT GENERATION TRAINING & SIMULATION SYSTEMS	18,072	5,500	23,572
			Test and evaluation simulations		[2,500]	
			Automatic virtual environment		[3,000]	
2040	0603020A	40	TRACTOR ROSE	4,736		4,736
2040	0603103A	41	EXPLOSIVES DEMILITARIZATION TECHNOLOGY	9,706	4,000	13,706

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
			Missile recycling		[2,000]	
			Munitions demilitarization		[2,000]	
2040	0603105A	42	MILITARY HIV RESEARCH	6,641		6,641
2040	0603125A	43	COMBATING TERRORISM, TECHNOLOGY DEVELOPMENT	3,383		3,383
2040	0603238A	44	GLOBAL SURVEILLANCE/AIR DEFENSE/PRECISION STRIKE TECHNOLOGY D	10,721		10,721
2040	0603270A	45	ELECTRONIC WARFARE TECHNOLOGY	9,382		9,382
2040	0603313A	46	MISSILE AND ROCKET ADVANCED TECHNOLOGY	92,800	7,500	100,300
			Close-in Active Protection System (CIAPS)		[7,500]	
2040	0603322A	47	TRACTOR CAGE	13,312		13,312
2040	0603606A	48	LANDMINE WARFARE AND BARRIER ADVANCED TECHNOLOGY	25,577		25,577
2040	0603607A	49	JOINT SERVICE SMALL ARMS PROGRAM	5,968		5,968
2040	0603654A	50	LINE-OF-SIGHT TECHNOLOGY DEMONSTRATION			
2040	0603710A	51	NIGHT VISION ADVANCED TECHNOLOGY	50,071	4,800	54,871
			Cost Effective Targeting Systems - demo/integrate into Stryker		[4,800]	
2040	0603728A	52	ENVIRONMENTAL QUALITY TECHNOLOGY DEMONSTRATIONS	14,666		14,666
2040	0603734A	53	MILITARY ENGINEERING ADVANCED TECHNOLOGY	3,865	6,200	10,065
			Advanced mobile microgrid		[6,200]	
2040	0603772A	54	ADVANCED TACTICAL COMPUTER SCIENCE AND SENSOR TECHNOLOGY	31,951		31,951
2040	0603305A	55	ARMY MISSILE DEFENSE SYSTEMS INTEGRATION(NON SPACE)	53,509	31,000	84,509
			C4ISR visualization		[3,000]	
			Integrated composite missile structure		[7,000]	
			Interactive modeling and simulation		[3,000]	
			Remote sensor monitoring technology research program		[3,000]	
			Mobile tactical high energy laser		[15,000]	

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
2040	0603308A	56	ARMY MISSILE DEFENSE SYSTEMS INTEGRATION (SPACE)	4,871		4,871
2040	0603327A	57	AIR AND MISSILE DEFENSE SYSTEMS ENGINEERING	91,713	12,000	103,713
			Adaptive integrated fire control demo program		[2,000]	
			E-STRIKE		[10,000]	
2040	0603619A	58	LANDMINE WARFARE AND BARRIER - ADV DEV	11,634		11,634
2040	0603627A	59	SMOKE, OBSCURANT AND TARGET DEFEATING SYS-ADV DEV	6,249		6,249
2040	0603639A	60	TANK AND MEDIUM CALIBER AMMUNITION	39,697		39,697
2040	0603645A	61	ARMORED SYSTEM MODERNIZATION - ADV DEV			
2040	0603653A	62	ADVANCED TANK ARMAMENT SYSTEM (ATAS)	51,892		51,892
2040	0603747A	63	SOLDIER SUPPORT AND SURVIVABILITY	13,810		13,810
2040	0603766A	64	TACTICAL ELECTRONIC SURVEILLANCE SYSTEM - ADV DEV	15,441		15,441
2040	0603774A	65	NIGHT VISION SYSTEMS ADVANCED DEVELOPMENT	14,047		14,047
2040	0603779A	66	ENVIRONMENTAL QUALITY TECHNOLOGY	9,356	4,600	13,956
			Manganese Health Research Project		[4,600]	
2040	0603782A	67	WARFIGHTER INFORMATION NETWORK-TACTICAL	99,645		99,645
2040	0603790A	68	NATO RESEARCH AND DEVELOPMENT	4,801		4,801
2040	0603801A	69	AVIATION - ADV DEV	12,113		12,113
2040	0603802A	70	WEAPONS AND MUNITIONS - ADV DEV	2,382	2,000	4,382
			120MM mortar family advance development		[2,000]	
2040	0603804A	71	LOGISTICS AND ENGINEER EQUIPMENT - ADV DEV	10,485	6,000	16,485
			Mobile parts hospital - continue development		[6,000]	
2040	0603805A	72	COMBAT SERVICE SUPPORT CONTROL SYSTEM EVALUATION AND ANALYS	6,366		6,366
2040	0603807A	73	MEDICAL SYSTEMS - ADV DEV	10,258		10,258
2040	0603850A	74	INTEGRATED BROADCAST SERVICE (JMIP/DISTP)	4,356		4,356

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
2040	0603854A	75	ARTILLERY SYSTEMS			
2040	0603856A	76	SCAMP BLOCK II	10,221		10,221
2040	0603869A	77	MEDIUM EXTENDED AIR DEFENSE SYSTEM (MEADS) CONCEPTS	264,527	64,178	328,705
			PAC-3/MEADS (transfer from 64865A, line 126)		[64,178]	
2040	0604201A	78	AIRCRAFT AVIONICS	68,857		68,857
2040	0604220A	79	ARMED, DEPLOYABLE OH-58D	20,000		20,000
2040	0604223A	80	COMANCHE			
2040	0604270A	81	ELECTRONIC WARFARE DEVELOPMENT	16,879		16,879
2040	0604280A	82	JOINT TACTICAL RADIO	121,400		121,400
2040	0604321A	83	ALL SOURCE ANALYSIS SYSTEM	5,346		5,346
2040	0604328A	84	TRACTOR CAGE	14,149		14,149
2040	0604329A	85	COMMON MISSILE	152,381		152,381
2040	0604601A	86	INFANTRY SUPPORT WEAPONS	28,187	12,500	40,687
			XM312 .50 caliber advanced crew served weapon		[4,000]	
			XM-307 25mm advanced crew served weapon		[8,500]	
2040	0604604A	87	MEDIUM TACTICAL VEHICLES	2,854	3,000	5,854
			Medium tactical vehicle R&D - accelerate FMTV replacement		[3,000]	
2040	0604609A	88	SMOKE, OBSCURANT AND TARGET DEFEATING SYS-SDD	3,798		3,798
2040	0604611A	89	JAVELIN	944		944
2040	0604622A	90	FAMILY OF HEAVY TACTICAL VEHICLES	2,479	10,000	12,479
			Tactical wheeled vehicle development		[10,000]	
2040	0604633A	91	AIR TRAFFIC CONTROL	2,088		2,088
2040	0604641A	92	TACTICAL UNMANNED GROUND VEHICLE (TUGV)			

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
2040	0604642A	93	LIGHT TACTICAL WHEELED VEHICLES		15,000	15,000
			HMMWV block improvement program - initiate development		[15,000]	
2040	0604645A	94	ARMORED SYSTEMS MODERNIZATION (ASM)-SDD	2,700,455		2,700,455
2040	0604647A	95	NON-LINE OF SIGHT CANNON	497,643		497,643
2040	0604649A	96	ENGINEER MOBILITY EQUIPMENT DEVELOPMENT			
2040	0604710A	97	NIGHT VISION SYSTEMS - SDD	24,693		24,693
2040	0604713A	98	COMBAT FEEDING, CLOTHING, AND EQUIPMENT	115,093	2,500	117,593
			Integrated battle space combat situational awareness system		[2,500]	
2040	0604715A	99	NON-SYSTEM TRAINING DEVICES - SDD	51,694		51,694
2040	0604716A	100	TERRAIN INFORMATION - SDD	3,199		3,199
2040	0604726A	101	INTEGRATED METEOROLOGICAL SUPPORT SYSTEM	2,485		2,485
2040	0604738A	102	JSIMS CORE PROGRAM			
2040	0604741A	103	AIR DEFENSE COMMAND, CONTROL AND INTELLIGENCE - SDD	27,376		27,376
2040	0604742A	104	CONSTRUCTIVE SIMULATION SYSTEMS DEVELOPMENT	42,869		42,869
2040	0604746A	105	AUTOMATIC TEST EQUIPMENT DEVELOPMENT	4,713	2,500	7,213
			Accelerate diagnostic and expert system development		[2,500]	
2040	0604760A	106	DISTRIBUTIVE INTERACTIVE SIMULATIONS (DIS) - SDD	26,985		26,985
2040	0604766A	107	TACTICAL SURVEILLANCE SYSTEMS - SDD	21,821		21,821
2040	0604768A	108	ARMY TACTICAL MISSILE SYSTEM (ATACMS)	21	5,000	5,021
			Viper Strike		[5,000]	
2040	0604770A	109	JOINT SURVEILLANCE/TARGET ATTACK RADAR SYSTEM (JSTARS)			
2040	0604778A	110	POSITIONING SYSTEMS DEVELOPMENT (SPACE)	2,048		2,048
2040	0604780A	111	COMBINED ARMS TACTICAL TRAINER (CATT) CORE	23,849		23,849
2040	0604783A	112	JOINT NETWORK MANAGEMENT SYSTEM	10,726		10,726

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
2040	0604801A	113	AVIATION - SDD	2,378		2,378
2040	0604802A	114	WEAPONS AND MUNITIONS - SDD	125,885	17,000	142,885
			APKWS - semi-active laser seeker production transition initiative		[7,000]	
			Precision guided mortar munitions - accelerate Block I		[10,000]	
2040	0604804A	115	LOGISTICS AND ENGINEER EQUIPMENT - SDD	89,151		89,151
2040	0604805A	116	COMMAND, CONTROL, COMMUNICATIONS SYSTEMS - SDD	219,790		219,790
2040	0604807A	117	MEDICAL MATERIEL/MEDICAL BIOLOGICAL DEFENSE EQUIPMENT - SDD	11,727		11,727
2040	0604808A	118	LANDMINE WARFARE/BARRIER - SDD	51,045		51,045
2040	0604814A	119	ARTILLERY MUNITIONS	133,297		133,297
2040	0604817A	120	COMBAT IDENTIFICATION	6,994		6,994
2040	0604818A	121	ARMY TACTICAL COMMAND & CONTROL HARDWARE & SOFTWARE	68,110		68,110
2040	0604819A	122	LOSAT	22,628		22,628
2040	0604820A	123	RADAR DEVELOPMENT	6,107		6,107
2040	0604823A	124	FIREFINDER	18,516		18,516
2040	0604854A	125	ARTILLERY SYSTEMS	9,550		9,550
2040	0604865A	126	PATRIOT PAC-3 THEATER MISSILE DEFENSE ACQUISITION	64,178	-64,178	
			PAC-3 (transfer to 63869A, line 77)		[-64,178]	
2040	0605013A	127	INFORMATION TECHNOLOGY DEVELOPMENT	95,261		95,261
2040	0604256A	128	THREAT SIMULATOR DEVELOPMENT	22,101		22,101
2040	0604258A	129	TARGET SYSTEMS DEVELOPMENT	11,017		11,017
2040	0604759A	130	MAJOR T&E INVESTMENT	57,987		57,987
2040	0605103A	131	RAND ARROYO CENTER	20,012		20,012
2040	0605301A	132	ARMY KWAJALEIN ATOLL	143,921		143,921
2040	0605326A	133	CONCEPTS EXPERIMENTATION PROGRAM	22,727		22,727

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
2040	0605502A	134	SMALL BUSINESS INNOVATIVE RESEARCH			
2040	0605601A	135	ARMY TEST RANGES AND FACILITIES	181,114		181,114
2040	0605602A	136	ARMY TECHNICAL TEST INSTRUMENTATION AND TARGETS	52,433		52,433
2040	0605604A	137	SURVIVABILITY/LETHALITY ANALYSIS	44,648		44,648
2040	0605605A	138	DOD HIGH ENERGY LASER TEST FACILITY	15,725		15,725
2040	0605606A	139	AIRCRAFT CERTIFICATION	3,485		3,485
2040	0605702A	140	METEOROLOGICAL SUPPORT TO RDT&E ACTIVITIES	8,711		8,711
2040	0605706A	141	MATERIEL SYSTEMS ANALYSIS	18,000		18,000
2040	0605709A	142	EXPLOITATION OF FOREIGN ITEMS	4,740		4,740
2040	0605712A	143	SUPPORT OF OPERATIONAL TESTING	71,239		71,239
2040	0605716A	144	ARMY EVALUATION CENTER	62,209		62,209
2040	0605718A	145	SIMULATION & MODELING FOR ACQ, RQTS, & TNG (SMART)	1,935		1,935
2040	0605801A	146	PROGRAMWIDE ACTIVITIES	59,368		59,368
2040	0605803A	147	TECHNICAL INFORMATION ACTIVITIES	27,713	3,000	30,713
			Supercomputing research		[3,000]	
2040	0605805A	148	MUNITIONS STANDARDIZATION, EFFECTIVENESS AND SAFETY	14,611	500	15,111
			Battle effects simulator		[500]	
2040	0605857A	149	ENVIRONMENTAL QUALITY TECHNOLOGY MGMT SUPPORT	4,527		4,527
2040	0605898A	150	MANAGEMENT HQ - R&D	11,575		11,575
2040	0909999A	151	FINANCING FOR CANCELLED ACCOUNT ADJUSTMENTS			
2040	0102419A	152	JOINT LAND ATTACK CRUISE MISSILES DEFENSE (JLENS)	81,514		81,514
2040	0203610A	153	DOMESTIC PREPAREDNESS AGAINST WMD			
2040	0203726A	154	ADV FIELD ARTILLERY TACTICAL DATA SYSTEM	17,994		17,994
2040	0203735A	155	COMBAT VEHICLE IMPROVEMENT PROGRAMS	15,952		15,952

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
2040	0203740A	156	MANEUVER CONTROL SYSTEM	24,753		24,753
2040	0203744A	157	AIRCRAFT MODIFICATIONS/PRODUCT IMPROVEMENT PROGRAMS	242,853		242,853
2040	0203752A	158	AIRCRAFT ENGINE COMPONENT IMPROVEMENT PROGRAM	2,427	10,000	12,427
			Full Authority Control (FADEC) for armed reconnaissance Helicopters		[10,000]	
2040	0203758A	159	DIGITIZATION	24,506		24,506
2040	0203759A	160	FORCE XXI BATTLE COMMAND, BRIGADE AND BELOW (FBCB2)	23,510		23,510
2040	0203801A	161	MISSILE/AIR DEFENSE PRODUCT IMPROVEMENT PROGRAM	31,690	5,000	36,690
			Advanced composite radome		[5,000]	
2040	0203802A	162	OTHER MISSILE PRODUCT IMPROVEMENT PROGRAMS	4,863		4,863
2040	0203806A	163	TRACTOR RUT	3,321		3,321
2040	0203808A	164	TRACTOR CARD	9,023		9,023
2040	0208010A	165	JOINT TACTICAL COMMUNICATIONS PROGRAM (TRI-TAC)	18,177		18,177
2040	0208053A	166	JOINT TACTICAL GROUND SYSTEM	9,967		9,967
2040	0301359A	167	SPECIAL ARMY PROGRAM	5,213		5,213
2040	0303028A	168	SECURITY AND INTELLIGENCE ACTIVITIES		16,000	16,000
			Document exploitation		[4,000]	
			Information Dominance Center		[8,000]	
			Pathfinder Data Analysis Tool		[4,000]	
2040	0303140A	169	INFORMATION SYSTEMS SECURITY PROGRAM	24,725		24,725
2040	0303141A	170	GLOBAL COMBAT SUPPORT SYSTEM	94,215		94,215
2040	0303142A	171	SATCOM GROUND ENVIRONMENT (SPACE)	51,959		51,959
2040	0303150A	172	WWMCCS/GLOBAL COMMAND AND CONTROL SYSTEM	19,204		19,204
2040	0305114A	173	TRAFFIC CONTROL, APPROACH AND LANDING SYSTEM			
2040	0305204A	174	TACTICAL UNMANNED AERIAL VEHICLES (JMIP)	45,627		45,627

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
2040	0305206A	175	AIRBORNE RECONNAISSANCE SYSTEMS	5,128	6,200	11,328
			Longwave Imaging development		[6,200]	
2040	0305208A	176	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS	43,254		43,254
2040	0702239A	177	MLRS PRODUCT IMPROVEMENT PROGRAM	97,422		97,422
2040	0702239A	178	AVIONICS COMPONENT IMPROVEMENT PROGRAM	997		997
2040	0708045A	179	END ITEM INDUSTRIAL PREPAREDNESS ACTIVITIES	67,236	8,500	75,736
			Packaging and interconnection technology		[3,000]	
			Virtual parts program		[3,000]	
			Lean manufacturing system demonstrations		[2,500]	
2040	1001018A	180	NATO JOINT STARS	595		595
2040	XXXXXX	180A	Army Aviation Test Bed		48,000	48,000
			Financial information systems		-18,200	-18,200
			Total, RDT&E Army	**9,266,258**	**420,700**	**9,686,958**

Army basic research

The budget request included $131.3 million in PE 61102A for defense research sciences. The committee notes that past investments in basic research at universities and in industry developed the technologies which are being used in current operations, including the Global Positioning System (GPS), computer networks, and body armor. The committee recommends an increase in PE 61102A of $11.5 million for this fundamental science, which promotes advances in all aspects of Army research. Of this amount, the committee recommends an increase of $2.5 million for predictive modeling and information analysis of desert terrains in support of military operations; $2.0 million for reactive surface technology; $2.0 million to support research on unique performance issues facing military vehicles in low temperature environments; $2.0 million for advanced deployable sensors to develop remote target recognition and identification capabilities; and $3.0 million for long-term backplane electronics technology research and infrastructure development for flexible displays. The basic research program is conducted in support of the larger consortium on flexible displays geared toward a U.S. based manufacturing capability.

Army university research

The budget request included $75.1 million in PE 61103A for the University Research Initiative (URI) program. The URI program provides key support and equipment to the academic community working in support of defense missions. Additional resources focused on emerging needs would yield tools useful to address new challenges on changing battlefields. The committee recommends an increase in PE 61103A of $2.0 million for antiterrorism building and construction in support of the Department's comprehensive approach to force protection.

University industry research centers

The budget request included $77.7 million in PE 61104A for the Army's University and Industry Research Centers. A significant portion of the work performed within this program directly supports future force requirements. To further research aimed at enabling technologies for future force capabilities, the committee recommends an increase of $6.0 million in PE 61104A: $2.0 million for nanocomposite materials research for use in optical devices and for stealth coatings; $2.5 million for ferroelectric nanodevice development for secure communications and rapid information gathering; and $1.5 million for information assurance research in areas of insider threat mitigation, wireless and sensor network security, secure distributed computing, user interface design for secure applications, and information assurance education standards.

Army materials technology

The budget request included $15.4 million in PE 62105A for materials technology. To enhance survivability and lethality of Future Combat Systems, the committee recommends an increase in PE 62105A of $7.5 million: $2.5 million for Army mine detection and blast mitigation research; $2.0 million for affordable multi-utility materials, and $3.0 million for advanced materials processing.

Army persistent surveillance

The budget request included $25.6 million in PE 62120A for sensors and electronic survivability. The committee recommends an increase in PE 62120A of $1.5 million to accelerate the development of a small airship surveillance system to address the Army's challenge in the area of long-term remote detection capabilities. Research on the small airship configuration would yield a stable, unobtrusive, platform capable of persistent, 360-degree, airborne surveillance for stationary and near-stationary targets. Research on this program would also develop integration of propulsion systems, electro-optical and forward-looking infrared radar camera systems, and integrated command and control systems and workstation software.

Silver Fox unmanned aerial vehicle

The budget request included $98.8 million in PE 62114N for power projection applied research and $41.6 million in PE 62211A for aviation technology. The committee recommends an increase in PE 62114N of $5.0 million and in PE 62211A of $5.0 million for accelerated development of the Silver Fox unmanned aerial vehicle. The small Silver Fox configuration is launchable from a Navy ship and will assist with missions such as downed pilot search and rescue, sub detection, and marine mammal detection efforts. The project will be adapted for the Army to provide tactical support for ground troops and special operations forces.

Missile technology

The budget request included $60.0 million in PE 62303A for missile technology. Critical component technologies necessary to improve present and future missile performance have been developed and demonstrated. The Army must obtain flight test data on these component technologies to evaluate their flight performance and to confirm the validity of analysis techniques used to predict component performance over the range of required mission scenarios. The committee recommends an increase in PE 62303A of $2.0 million for an Army multicomponent flight test.

The committee further recommends an increase in PE 62303A of $2.0 million for hypersonic engine research and $2.0 million for air defense science focused on countering the threat of rockets, artillery and mortar projectiles after launch. Technologies developed and demonstrated will enable stationary and mobile 360 degree extended protection, while minimizing cost, weight, and space requirements.

Advanced weapons technology

The budget request included $16.6 million in PE 62307A for advanced weapons technology. The committee recommends an increase in PE 62307A of $2.0 million to accelerate development, delivery, integration, and testing of a new rapid target acquisition and tracking system for rockets, mortar and artillery. The new system will employ larger optics with higher angle resolution, and will utlize new software that is capable of accurately evaluating target trajectory in real time for weapons launch positions.

Advanced concepts and simulation

The budget request included $15.4 million in PE 62308A for advanced concepts and simulation. Unmanned systems currently support the warfighter in many ways from surveillance to combat missions. These systems and capabilities also represent a large untapped potential. Many autonomous systems have not advanced to the point of meaningful military application due, in part, to an incomplete science of testing unmanned systems, inaccessibility to dedicated standard testing facilities and limited compatibility between various aerial and ground systems. The committee recommends an increase of $6.8 million in PE 62308A to support a joint unmanned systems testing and evaluation course.

To further overall Army advanced concepts and simulation efforts, the committee recommends an increase in PE 62308A of $2.0 million for photonics research and $2.5 million for advanced modeling and simulation.

Combat vehicle and automotive research

The budget request included $69.6 million in PE 62601A for applied research on combat vehicles and automotive technologies. The committee notes that this research is designed to develop leap-ahead armor, propulsion, and other automotive technologies to support the development of Future Combat Systems (FCS). The committee recommends an increase in PE 62601A of $2.0 million for technologies for the rapid prototyping of vehicle parts; $2.0 million for the development of lightweight, rechargeable batteries for FCS; $2.5 million for technologies for the development of control, vision, and navigation systems for future robotic ground vehicles; $3.0 million for advanced engineering research and manufacturing technologies for next generation vehicles; $3.0 million for advanced electric drives; and $3.0 million for phase two completion of the JP–8 plant. The flexible capability of the JP–8 plant will provide the U.S. military with a higher performing, versatile, ultra-clean single battlefield fuel, greatly reducing fuel logistics required for forward deployed forces.

Weapons and munitions technology

The budget request included $44.7 million in PE 62624A for weapons and munitions technology, designed to increase system lethality and survivability with the potential for better affordability, lower weight, and reduced size. To meet pressing needs in the areas of advanced armor and coatings, the committee recommends an increase in PE 62624A of $3.0 million for a systematic development approach to more effective lightweight ceramic armor and $4.0 million for active coating technology to produce cost-effective maintenance and camouflage protection options under various conditions. The Army continues to pursue development of new cannon systems for Future Combat Systems. The committee recommends an increase of $2.0 million to support research on development of new gun recoil mitigation technologies.

Electronics and electronic devices

The budget request included $41.2 million in PE 62705A for electronics and electronic devices. The committee recommends in-

creases in PE 62705A of $8.0 million for flexible display technologies to support the Army's future force and $3.0 million for software-defined radio research to ensure communications interoperability and service during emergencies.

Countermine systems

The budget request included $20.5 million in PE 62712A for countermine systems. The committee recommends an increase in PE 62712A of $4.0 million for polymer-based landmine detection systems. This technology provides for detection of explosive compounds in landmine and improvised explosive devices through chemical vapor sensing using amplifying fluorescent polymers.

Geosciences and atmospheric research

The budget request included $47.2 million in PE 62784A for military engineering technology in support of special requirements for battlefield visualization, including impacts of weather, terrain, and atmospheric obstacles on military equipment and operations. The committee recommends an increase in PE 62784A of $3.0 million for geoscience and atmospheric research to assist in meeting the Army's battlespace awareness goals and to provide prediction capabilities on agent dispersion and other phenomena.

Advanced composites for the warfighter

The budget request included $21.1 million in PE 62786A for warfighter technology. The use of advanced composites and materials has the potential to serve the Army's transformational goals in many ways. New composite materials applied to body armor and protective gear produce equipment that is higher strength with reduced weight. The new equipment has increased durability and is functionally integrated to include properties to counter ballistic, chemical, and biological threats. Composite research in the area of structures leads to increased construction and deployment speeds. The committee recommends an increase in PE 62786A of $14.5 million: $3.0 million for advanced construction structures and composites to support the Army's evolution into the future force; $7.0 million for supplemental body armor; $2.5 million for research on next generation chemical and biological agent protection garments; and $2.0 million for research into embedding communications systems in combat suits.

Amputee care and medical technology

The budget request included $60.9 million in PE 62787A for Army medical technology research. Today's combat operations are witnessing a surge in combat injuries involving amputation of major limbs. As of March 30, 2004, 92 military personnel had lost one or more limbs as a direct result of injuries sustained in Operation Iraqi Freedom and Operation Enduring Freedom. Eighty military amputees and one civilian have been cared for at the military amputee patient care program at Walter Reed Army Medical Center. Medical technology is rapidly developing to assist in the rehabilitation of amputees. Amputations caused by blast injuries present a more complex wounding pattern than amputations resulting from disease or other trauma. The committee believes that

more research is needed in this area, and that a military amputee patient care program is ideally suited to initiate and manage a program of intramural and extramural research in support of advancing amputee technology. Accordingly, the committee recommends an increase in PE 62787A of $8.7 million to pursue research specific to combat injuries resulting in amputations.

Quality medical care for U.S. soldiers on the battlefield and after combat remains a critical focus for the Army. Advances in technology to stop blood loss are already saving lives. Research into alternatives to successful human plasma-based fibrogen bandages would reduce the cost of this treatment and ensure it is readily available when needed. The committee recommends an increase in PE 62787A of $4.5 million for protein-based fibrogen bandage development.

Additional basic research on post tramatic stress and development of predictive tools that anticipate response to trauma using genetics, proteomics, and other biological and physical measures will assist in early assessment of conditions arising after deployments. The committee recommends an increase in PE 62787A of $2.0 million for post traumatic stress disorder research.

In light of concerns about the potential use of biological weapons, the committee recognizes the need to improve the understanding of genes and proteins produced by the anthrax bacterium and the human response to anthrax. The committee recommends an increase in PE 62787A of $3.0 million for the U.S. Army Medical Research Institute of Infectious Diseases to conduct enhanced anthrax research.

Medical research and technologies

The budget request included $60.9 million in PE 62787A for applied research on medical technologies. The budget request included $38.4 million in PE 63002A for medical advanced technology development. The committee notes that medical research of unique application to injuries and ailments resulting from service in the military is of great importance. The committee is concerned that medical programs not of clear and specific concern to the military are not well coordinated between the Department of Defense and other federal agencies pursuing health missions with substantial research budgets. The committee recommends a reduction in PE 62787A of $5.0 million and a reduction in PE 63002A of $5.0 million for growth in nondefense medical research, and encourages a focus on unique military health problems and battlefield medicine.

Technology and human systems integration

The budget request included $68.0 million in PE 63001A for warfighter advanced technology. The committee recommends an increase in PE 63001A of $2.0 million for integration of technology and human systems to ensure new protection equipment and sensor components are configured for human operation.

Medical advanced technology

The budget request included $38.4 million in PE 63002A for medical advanced technology. Military medical research and combat casualty care programs continue to evolve and progress. Additional

resources in targeted projects will accelerate capabilities nearing application. The committee recommends an increase in PE 63002A of $14.4 million: $4.0 million for elastin biomatrices research designed to repair blood vessels and tissue to save limbs; $2.0 million for a scalable, continuous, automatic monitoring, tracking and location system for medical records; $3.0 million for decontamination and disinfection of injuries exposed to biological agents; $3.0 million for electronic textiles; $1.0 million for accelerated diagnosis through digital imaging pattern recognition; and $1.4 million for research into field treatments for leishmaniasis, which is the skin ailment resulting from parasitic sand flies in Iraq.

Unmanned tactical combat vehicles

The budget request included $69.5 million in PE 63003A for advanced aviation technology and $58.0 million in PE 63640M for Marine Corps advanced technology demonstrations. The committee is aware of the near-term requirement for a cost-effective, survivable, tactical unmanned combat aerial vehicle (UCAV) that can reach conflict areas in a timely manner, engage and destroy targets of opportunity, provide overhead coverage at trouble spots, such as roadside ambushes, and operate without runways or launch mechanisms. The committee believes that the development of a survivable vertical takeoff and landing (VTOL) tactical-class combat air vehicle will cost-effectively introduce self-contained rapid response precision strike capability to the tactical commander. The committee recommends an increase in PE 63003A of $8.0 million and in PE 63640M of $1.0 million to address this requirement through development and concept of operations for the a tactical UCAV demonstrator.

Advanced penetrator munitions

The budget request included $67.6 million in PE 63004A for weapons munitions advanced technology. In order to explore environmentally benign alternatives to depleted uranium deep penetrators and for use on training firing ranges, the committee recommends an increase in PE 63004A of $2.0 million for small caliber advanced penetrator munitions.

Combat vehicle and automotive advanced technology

The budget request included $203.1 million in PE 63005A for combat vehicle and automotive advanced technology. The committee recommends an increase in PE 63005A of $36.2 for the development of automotive technologies that would support the transformation of the Army into a lighter, more lethal force, and would contribute to the development of the Future Combat Systems (FCS). Specifically, the committee recommends an additional $3.5 million for the development of next generation non-tactical vehicle propulsion systems; $6.1 million for the demonstration of fuel cell ground support equipment; $2.0 million for research on the design of future Army tactical vehicles; $3.5 million for the development of vehicle thermal management control systems; $2.0 million for research on fastener and joining technologies; $4.0 million for the development of armored composite cab materials; $4.0 million for electrochromic materials research to develop smart windows; $3.0

million for advanced titanium armor systems; $1.5 million for FCS common chassis design; $3.0 million for non-line of sight cannon structure design; and $3.6 million for the Army's unfunded opportunity in the area of kinetic energy active protection systems and countermeasures for the FCS.

Coordinated training

The budget request included $7.3 million in PE 63007A for manpower, personnel and training advanced technology. The Army is working to ensure that the "human component" of warfighting keeps pace with the transformation in systems, weapons, equipment, and requirements. Development of more effective collective training methods is a key goal of this effort. The committee recommends an increase of $3.0 million in PE 63007A for coordinated training.

Electronic warfare advanced technology

The budget request included $41.8 million in PE 63008A for electronic warfare advanced technology. The committee recommends increases in PE 63008A of $2.0 million for a high altitude intercept platform for image processing and target recognition and classification; $2.0 million for a networking environment for command, control, communications, and mobile services; and $3.0 million for the portable and mobile emergency response broadband system. These project increases would explore developments in advanced antenna technology, advanced battery technology, alternative frequency technology, and extended range and wearable configuration capabilities designed to increase persistent, secure communications and battlespace awareness.

Next generation training and simulation systems

The budget request included $18.1 million in PE 63015A for next generation training and simulation systems. The committee commends the Army for its innovative approach to highly immersive training and simulation through the creation of the Institute for Creative Technologies, and recommends increases in PE 63015A of $3.0 million for automatic virtual environment research and $2.5 million for the continued development of interactive test and evaluation simulators to support training and mission rehearsal exercises.

Explosives demilitarization technology

The budget request included $9.7 million in PE 63103A for explosives demilitarization technology. The Army has implemented a comprehensive strategic plan—integrated through the leadership of the Joint Ordnance Commanders Demilitarization Subgroup—for demilitarization of approximately 400,000 tons of material requiring disposition. The committee recommends an increase in PE 63103A of $2.0 million for demilitarization of obsolete munitions using a promising new approach—the actodemil process—which recycles nitrogen containing energetic components into fertilizer and has been validated by the Joint Demilitarization Technology program. The committee further recommends an increase in PE

63103A of $2.0 million for advancement of missile recycling capabilities.

Close-in active protection

The budget request included $92.8 million in PE 63313A, for missile and rocket advanced technology, but no funding for the Close-in Active Protection System (CIAPS), which consists of an omni-directional radar that can detect an incoming threat at very short-range and launch prepositioned interceptors to destroy the threat before it hits the protected vehicle. On March 3, 2004, the Deputy Commanding General, U.S. Army Research, Development and Engineering Command, System of Systems Integration, testified that the CIAPS is effective against anti-tank guided missiles, as well as rocket-propelled grenades. The committee supports continued development of this technology, and recommends an increase of $7.5 million for CIAPS, for a total authorization of $100.3 million in PE 63313A.

Cost effective targeting system

The budget request included $50.1 million in PE 63710A for night vision advanced technology, but no funding for the cost effective targeting system (CETS). The CETS autonomously searches for targets and threats and presents only targets with high probability to the operator, either at a remote location for unmanned platforms or directly to the operator on manned platforms. The committee believes that a demonstration may provide insights into future application on Stryker combat vehicles. The committee recommends an increase of $4.8 million in PE 63710A for CETS, for a total authorization of $54.9 million.

Advanced mobile micro grid technology

The budget request included $3.9 million in PE 63734A for military engineering advanced technology. The committee recommends an increase in PE 63734A of $6.2 million for development and demonstration of a micro power grid capability to quickly provide transportable and scalable blocks of electric power to deployed forces. The committee notes that a mobile power generation and transmission capability has the advantage of providing the Department of Defense with packaged, transportable energy that could be moved anywhere in the world to support the deployment of military forces.

Advanced visualization tools

The budget request included $53.5 million in PE 63305A for missile defense systems integration, but no funding for advanced visualization tools.

The committee notes that the Missile Defense Agency is developing a single ballistic missile defense system that will integrate the capabilities of various sensors, interceptors, and battle management components. The committee recognizes the importance to that enterprise of advanced tools to provide commanders with a common picture of the battlespace. Advanced visualization tools that can accept data from various sources and assimilate the data into a common operational and tactical picture will be essential to effective

command and control for missile defense and other military missions. Such tools also enhance training, mission planning, and mission rehearsal.

The committee recommends an increase of $3.0 million in PE 63305A for continued development of battle space visualization tools.

Interactive modeling and simulation management

The budget request included $53.5 million in PE 63305A for missile defense systems integration, but no funding for interactive modeling and simulation management capability.

The committee notes that effective modeling and simulation is essential to the development of missile defenses and other military capabilities. Although verification and validation of modeling and simulation tools are required, the committee understands that there is no formal process to coordinate or manage the activities needed for such verification and validation.

The committee recommends an increase of $3.0 million in PE 63305A for development of technologies and processes to support verification and validation of modeling and simulation.

Integrated composite missile structures

The budget request included $53.5 million in PE 63305A for missile defense systems integration, but no funding for integrated composite missile structures.

Current missile airframes are complex multi-tiered structures consisting of a heatshield, a bondline, and a substructure that can potentially limit missile performance because of inherent limits in thermal protection, structural integrity, and electromagnetic shielding properties. The committee believes, based on prior research and development efforts, that integrated composite missile structures have the potential to reduce cost and weight while significantly enhancing missile performance, including increased range and better thermal protection. These prior efforts also suggest that manufacturing such complex composite structures is feasible. The improved performance offered by such structures could be valuable for a variety of military applications, including missile defense.

Therefore, the committee recommends an increase of $7.0 million in PE 63305A to demonstrate the feasibility of manufacturing integrated composite missile structures.

Mobile tactical high energy laser

The budget request included $53.5 million in PE 63305A for missile defense systems integration, of which $38.5 million is for the development of the mobile tactical high energy laser (MTHEL).

The committee believes that directed energy weapons could play an important role in future air and missile defense systems. MTHEL is an effort to develop, in cooperation with the Israeli Ministry of Defense, a mobile high energy gas laser to destroy short-range rockets and artillery shells in flight. The committee supports this effort. The program is a follow-on to the tactical high energy laser (THEL) advanced concept technology demonstration, which successfully destroyed short-range rockets in flight from a fixed site.

The committee notes that the use of a gas laser will require transport of volatile chemical fuels with the operational laser system. The committee is aware of very successful tests of a solid state heat capacity laser and recent fabrication advances that will contribute to the development of a 100 kilowatt variant of this laser. The committee recognizes that solid state lasers have several advantages over gas lasers related to compactness and logistics support. The committee believes that solid state laser technology is sufficiently mature to warrant an effort to accelerate development of a 100 kilowatt solid state laser and an integrated system demonstration of this laser as part of the MTHEL effort.

The committee recommends an increase of $15.0 million in PE 63305A for continued development of the MTHEL and integration of solid state laser technology into the MTHEL effort.

Remote sensor monitoring technology research program

The budget request included $53.5 million in PE 63305A for research and development related to Army defense systems integration, but no funding for the remote sensor monitoring technology program.

The committee believes that the development of miniature, high brightness, tunable, multicolor lasers for radiation detection could improve the capability to detect materials in so-called "dirty bombs" and clandestine nuclear production facilities. Current single color lasers do not have the necessary standoff capability.

The committee recommends an increase of $3.0 million in PE 63305A to develop miniature, high brightness, tunable, multicolor lasers for radiation detection.

Adaptive integrated fire control

The budget request included $91.7 million in PE 63327A for air and missile defense systems engineering, but no funding for adaptive integrated fire control.

The committee recommends an increase of $2.0 million in PE 63327A for adaptive integrated fire control.

Enhanced area air defense system short-range integrated kinetic energy system

The budget request included $91.7 million in PE 63327A for air and missile defense systems engineering, but no funding for the enhanced area air defense system (EAADS) short-range integrated kinetic energy (E–STRIKE) system.

The committee recognizes the serious threat to deployed U.S. forces posed by mortars, artillery, and short-range rockets, and the near-term need to counter these threats. The short flight time and small target size will require enhanced radar and fire control capabilities and technical innovation to meet those more stringent requirements. The committee believes that additional funding is needed to support system of system concept development, risk reduction, and technical assessments to achieve timely deployment of E–STRIKE radar and missile technologies.

The committee recommends an increase of $10.0 million in PE 63327A for E–STRIKE research and development.

Manganese Health Research Program

The budget request included $9.4 million in PE 63779A for environmental quality technology. The committee recommends an increase of $4.6 million in PE 63779A for the Manganese Health Research Program (MNRP). The committee supports the development of better ways to protect the health of those exposed to manganese through their work or in the environment. The military departments are significant customers of manganese. Manganese is a component of coated welding rods and various steel alloys. The committee notes that MNRP consists of a unique partnership of the U.S. government, domestic and international industry, and academic researchers, seeking to reduce the adverse health effects that can be caused by certain exposures to manganese.

120mm mortar advanced development

The budget request included $2.4 million in PE 63802A for weapons and munitions advanced development, but no funding for the 120mm mortar advanced development, the replacement for the current family of 120mm mortar. The committee notes that the Future Combat Systems has a requirement for an extended range munition for the Non-Line of Sight Mortar. The committee recommends an increase of $2.0 million in PE 63802A for the advanced development of a 120mm mortar, for a total authorization of $4.4 million.

Mobile parts hospital

The budget request included $10.5 million in PE 63804A for logistics and engineer support equipment, but no funding for the mobile parts hospital (MPH), a self-contained, self-sustaining mobile mini-manufacturing center that can produce spare parts near the point of need. The committee notes that MPH has begun manufacturing vehicle parts at Camp Arifjan, Kuwait, in support of Operation Iraqi Freedom. The committee recommends an increase of $6.0 million for continuing the MPH development, for a total authorization of $16.5 million in PE 63804A.

Advanced crew served weapon

The budget request included $28.2 million in PE 64601A, for the development of the XM–307 advanced crew served weapon, but included no funds for the continued development of the XM–312, a variant of the XM–307. The XM–307 advanced crew served weapon system is the next generation replacement for the heavy grenade machine guns. The XM–312 is the .50 caliber variant of the XM–307.

The committee notes that the XM–307 advanced crew served weapon requirement was approved as part of the Future Combat Systems (FCS) Operational Requirements Document, dated April 4, 2003. The committee understands that the FCS lethality integrated product team has recommended the XM–307 as either the primary or secondary armament solution for nine of the manned and unmanned ground vehicles of FCS.

The committee notes that the XM–312 variant fires all existing .50 caliber ammunition, including the M903 saboted light armoring penetrating round. The committee understands that the XM–312

.50 caliber variant of the XM–307 is required as a development and integration tool to reduce test costs and prototype development.

The committee recommends an increase of $8.5 million for the continued development of the XM–307 crew served weapon and an increase of $4.0 million for the product improvement and integration costs for the XM–312 .50 caliber machine gun, for a total authorization of $40.7 million in PE 64601A.

Family of medium tactical vehicles evolution

The budget request included $2.9 million in PE 64604A, for medium tactical vehicle development, but did not include funding for the next generation of the family of medium tactical vehicles (FMTV). Lessons learned from Operation Iraqi Freedom indicate that the medium tactical vehicle fleet will require improvements in survivability and range, and will require a payload movement tracking system capability in order to support Future Combat Systems (FCS). The committee notes that the Army is in the second year of a five year FMTV competitive rebuy contract. The committee believes that the Army should include FCS technologies in the next iteration of FMTV to enable the FMTV fleet to keep pace with the future force both in technical power and network capability. The committee recommends an increase of $3.0 million in PE 64604A for the development of the next generation of FMTV, for a total authorization of $5.9 million.

Tactical wheeled vehicle development

The budget request included $2.5 million in PE 64622A, for a family of heavy tactical vehicles, but no funding for tactical wheeled vehicle development. The committee notes that the Army proposed the Future Tactical Truck System (FTTS) program to develop and demonstrate advanced wheeled vehicles and supporting technologies as a candidate for the Advanced Concept Technology Development (ACTD) program. In the summer of 2003, the Department of Defense approved the FTTS ACTD for fiscal year 2004 execution. This ACTD is supportive of the Army's Tactical Wheeled Vehicle (TWV) strategy. The committee notes that the Army programmed funds in the Future Years Defense Program to mature component technologies to enable timely and rapid delivery of supplies to Future Combat Systems units of action as a component of the FTTS ACTD. The committee recommends an increase of $10.0 million to accelerate TWV development in coordination with the FTTS ACTD, for a total authorization of $12.5 million in PE 64622A.

High mobility multi-purpose wheeled vehicle block improvement

The budget request included no funding in PE 64642A, for light tactical vehicles. Fiscal year 2004 funding completes the high mobility multi-purpose wheeled vehicle (HMMWV) modernization effort. The Army intends to initiate a HMMWV block improvement program in fiscal year 2007. The HMMWVs are being used extensively in Operation Enduring Freedom and Operation Iraqi Freedom. The committee believes that a block change and improvement program should be started in fiscal year 2005 to enable the Army

to insert emerging technologies into existing vehicles or those in production to meet Army objectives for improved reliability, range, repairability, and survivability. The committee recommends an increase of $15.0 million for initiation of a block improvement program for the HMMWV, for a total authorization of $15.0 million in PE 64642A.

Integrated battlespace combat situational awareness system

The budget request included $115.1 million in PE 64713A, including $91.3 million for land warrior (LW) development, but no funding for the integrated battlespace combat situational awareness system (IB–CSAS), a system that identifies friend from foe. The committee notes that funding is required to continue the developmental work conducted in fiscal years 2003 and 2004, to provide situational awareness, training capabilities and associated technologies. The committee recommends an increase of $2.5 million to continue IB–CSAS development, for a total authorization of $117.6 million in PE 64713A.

Automatic test equipment development

The budget request included $4.7 million in PE 64746A, for automatic test equipment development, including $3.8 million for development of the Next Generation Automatic Test System, Base Shop Test Facility (BSTF)(V)6, which provides state-of-the-art testing of digital, hybrid, and radio frequency electronics. The committee notes that the Army needs to improve test and diagnostic capabilities as digital equipment is introduced into Army equipment. The committee recommends an increase of $2.5 million in PE 64746A, for automated test equipment, for a total authorization of $7.2 million.

Viper Strike

The budget request included $21,000 in PE 64768A for the development of brilliant anti-armor submunitions, but no funding for the continued development of the Viper Strike munition, an unmanned aerial vehicle (UAV) precision munition. The Army has demonstrated that the Viper Strike munition provides pin-point accuracy against moving and stationary targets. The committee understands that on March 8, 2004, the Army Deputy Chief of Staff for Operations, at the request of the Commander, Joint Task Force 7, validated the operational requirement for weaponization of the Hunter UAV with Viper Strike munitions in support of Operation Iraqi Freedom. The committee believes that this capability should be accelerated for fielding to the combatant commanders, as soon as feasible. The committee recommends an increase of $5.0 million for the conversion of 70 munitions to the Viper Strike configuration, for a total authorization of $5.0 million in PE 64768A.

Advanced precision kill weapon system

The budget request included $125.9 million in PE 64802A, for weapons and munitions engineering development, including $12.5 million for the advanced precision kill weapon system (APKWS) and $14.7 million for the precision-guided mortar munition (PGMM). The APKWS and PGMM will provide the warfighter with

increased lethality due to the munitions precision targeting capability of these systems.

The APKWS is a highly accurate, low-cost weapon system. The committee understands the Army is developing a distributed semi-active laser seeker for APKWS. The PGMM is a laser guided mortar munition designed to defeat high pay-off targets. The committee notes that the Army is in the middle of the systems development and demonstration phase of the PGMM program. The PGMM is identified as a required capability in the Future Combat Systems Operational Requirements Document. The committee believes that the Army should accelerate these capabilities. The committee recommends an increase of $7.0 million for the continued development of the distributed aperture semi-active laser seeker for APKWS, and $10.0 million for accelerating PGMM development, for a total authorization of $142.9 million in PE 64802A.

Supercomputing research

The budget request included $27.7 million in PE 65803A for technical information activities. The committee recommends an increase in PE 65803A of $3.0 million for supercomputing research, which would support pressing needs for rapid simulation and analysis of alternative designs for armor, blast resistant materials, weapons to defeat specialized bunkers, and dispersion models.

Munitions standardization, effectiveness and safety

The budget request included $14.6 million in PE 65805A for munitions standardization, effectiveness and safety. The Army is exploring a series of new simulators that can provide realistic battle-condition training. The committee recommends an increase in PE 65805A of $0.5 million to certify safety of enhanced battle effects simulators that have improved artillery, mortar, anti-aircraft, and small arms fire capabilities.

Full authority digital engine control

The budget request included $2.4 million in PE 23752A, for the aircraft engine component improvement program, but no funding for the continued development of full authority digital engine control (FADEC). The FADEC reduces procurement costs, improves engine capability, and increases pilot safety by reducing pilot workload. The committee believes that FADEC should be applied now to the Kiowa Warrior helicopter and to the future light armed reconnaissance aircraft once requirements are identified and validated through the Joint Requirements Oversight Council process. The committee recommends an increase of $10.0 million for the development of the FADEC, for a total authorization of $12.4 million in PE 23752A.

Conceptual analysis tools

The budget request included $1.6 million in Research, Development, Test and Evaluation, Army, Security and Intelligence Activities, for continued development of the Pathfinder data analysis system.

The Pathfinder program was a groundbreaking initiative in the early 1990's that recognized the need for automated tools to help

analysts sort through large amounts of data quickly to find important, related pieces of information. Pathfinder has been a useful automation tool for intelligence analysis, but because of the nature of automation and software, the program requires constant upgrading and developmental work. Additional work is required to enable Pathfinder to function in conjunction with overall intelligence architecture standards in a networked, web-based environment, to support direct access and rapid visualization of knowledge by analysts.

The committee recommends an increase of $4.0 million in PE 33028A, for the continued development of conceptual analysis tools for the Pathfinder program.

Document exploitation

The budget request included no funding for Research, Development, Test and Evaluation, Army, Security and Intelligence Activities, for development of advanced document exploitation equipment.

Portable, rugged document exploitation equipment is currently not widely available to military personnel operating in deployed, austere environments. The technology exists to develop lightweight equipment that can scan documents, quickly search for important information in native languages and transmit potentially valuable documents back to exploitation facilities immediately, thus providing battlefield commanders with rapid exploitation of captured information. Recent experiences in Afghanistan and Iraq have demonstrated the value of such capabilities and the requirement for additional, improved capabilities.

The committee recommends an increase of $4.0 million in PE 33028A, to continue development, product improvement, and fielding of portable document exploitation systems.

Information Dominance Center

The Information Dominance Center (IDC) of the U.S. Army Intelligence and Security Command continues to conduct important operational and developmental work in the field of all-source analysis. A key aspect of this work is the development, testing, and use of state-of-the-art data mining and knowledge management tools that enable analysts to quickly sort through thousands of bits of data and recognize trends and relationships in disparate pieces of information. The IDC is well-funded in current budget allocations, and is projected to maintain satisfactory funding levels in the fiscal year 2005 budget request and Future Years Defense Program.

A critical aspect of achieving and sustaining information dominance is the availability of multiple databases and a reliable automation architecture. As the IDC concept matures and access to these analytical tools migrates to field locations around the world, the availability of databases and processing architectures must be maintained. These systems are subject to loss or inaccessibility caused by a variety of circumstances, including direct attack, cyber-attack, or acts of nature. To ensure continuity of operations and maintenance of information dominance, redundant databases and processing architectures are essential.

The committee recommends an increase of $8.0 million in PE 33028A, to establish redundant databases and processing architectures for the IDC.

Airborne reconnaissance systems

The budget request included $5.1 million in PE 35206A for airborne reconnaissance systems but included no funding for longwave imaging. Lessons learned for Operation Iraqi Freedom indicates that the Army requires technology that provides a capability to readily identify camouflaged or decoy targets, chemical agents, or buried improvised explosive devices (IED). The committee believes that the development of this capability using longwave imaging technology has the potential to result in an effective IED detection system. The committee recommends an increase of $6.2 million for longwave imaging technology development, for a total authorization of $11.3 million in PE 35206A.

Army parts and packaging systems

The budget request included $67.2 million in PE 78045A for End Item Industrial Preparedness Activities. Dealing with logistical and spare parts deficiencies, especially for legacy systems, is a manpower and resource drain for the Army, particularly in emergency conditions and during deployments. A virtual engineering environment has been explored that demonstrates a methodology for integration of digitized technical data, modeling, verification, and electronic transfer. The advanced virtual engineering environment produced by this project will assist the Army in meeting the need for parts for systems now out of production and for low-cost design of new components. The committee recommends an increase in PE 78045A of $3.0 million to support the virtual parts program; $3.0 million for new packaging and interconnection platforms to meet production needs for emerging composite materials and structures; and $2.5 million for lean manufacturing system demonstrations.

Advanced aviation technology test bed

While the committee supports the Army's decision to terminate the Comanche helicopter program, the committee believes that the technologies developed with the $6.9 billion expended during Comanche development must be made available for existing and future helicopter programs. The committee is concerned that the Army has not developed and funded a comprehensive program to retain Comanche-unique technologies, including the associated scientists, engineers, and laboratories. The committee notes that the Army has provided material to this committee that indicates the Army's plan to begin development of the Joint Multi-role Helicopter in fiscal year 2008.

The committee directs the Army to create an advanced aviation technology test bed to transfer technologies from the Comanche program to other existing and future platforms. In developing this test bed, the Army should ensure that significant portions of Comanche tools, processes, facilities, labs, and key personnel be retained for the test bed to support transfer of Comanche technologies to other programs. The committee further directs the Army to submit its plan for the advanced aviation technology test

bed, including those technologies most likely for transfer and proposed for Future Years Defense Program funding, to the congressional defense committees not later than March 31, 2005. The committee recommends $48.0 million in a program element identified by the Army with the submission of the fiscal year 2006 President's budget request, for the advanced aviation technology test bed.

Navy

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
			RESEARCH, DEVELOPMENT, TEST & EVALUATION, NAVY			
1319	0601103N	1	UNIVERSITY RESEARCH INITIATIVES	83,508	17,000	100,508
			Nanoscience research		[3,000]	
			Nanoparticle materials research		[1,500]	
			Remote sensing research		[1,000]	
			Corrosion research		[5,000]	
			Neural engineering research		[1,500]	
			Multifunctional materials for naval structures		[5,000]	
1319	0601152N	2	IN-HOUSE LABORATORY INDEPENDENT RESEARCH	17,664	2,500	20,164
			Navy S&T outreach		[2,500]	
1319	0601153N	3	DEFENSE RESEARCH SCIENCES	375,812		375,812
1319	0602114N	4	POWER PROJECTION APPLIED RESEARCH	98,831	5,000	103,831
			Silver Fox		[5,000]	
1319	0602123N	5	FORCE PROTECTION APPLIED RESEARCH	96,269	15,000	111,269
			Hyperspectral data fusion		[4,000]	
			Unmanned systems battery development		[3,000]	
			Structural reliability composite research		[1,000]	
			Fire retardant resins		[1,000]	
			Theater support vessel hull material development		[4,000]	
			Polymer aircraft components		[2,000]	
1319	0602131M	6	MARINE CORPS LANDING FORCE TECHNOLOGY	35,398		35,398
1319	0602232N	7	COMMUNICATIONS, COMMAND AND CONTROL, INTELL, SURVEILLANCE			
1319	0602233N	8	HUMAN SYSTEMS TECHNOLOGY			

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
1319	0602234N	9	MATERIALS, ELECTRONICS AND COMPUTER TECHNOLOGY			
1319	0602235N	10	COMMON PICTURE APPLIED RESEARCH	60,134		60,134
1319	0602236N	11	WARFIGHTER SUSTAINMENT APPLIED RESEARCH	63,726	23,000	86,726
			Aerospace alloy research		[2,000]	
			Microsystem fuze, safe & arm devices		[2,000]	
			Infectious disease analysis		[2,500]	
			Biowarfare detector		[2,500]	
			Sensornet		[12,000]	
			Titanium materials research		[2,000]	
1319	0602271N	12	RF SYSTEMS APPLIED RESEARCH	49,151	3,500	52,651
			Wide bandgap semiconductor research		[1,500]	
			High brightness electronics		[2,000]	
1319	0602435N	13	OCEAN WARFIGHTING ENVIRONMENT APPLIED RESEARCH	48,482	2,000	50,482
			Integrated littoral sensor network		[2,000]	
1319	0602747N	14	UNDERSEA WARFARE APPLIED RESEARCH	64,060	1,000	65,060
			Low acoustic propulsion		[1,000]	
1319	0602782N	15	MINE AND EXPEDITIONARY WARFARE APPLIED RESEARCH	48,016		48,016
1319	0603114N	16	POWER PROJECTION ADVANCED TECHNOLOGY	92,359	4,000	96,359
			Free electron laser		[9,000]	
			Unjustified growth		[-5,000]	

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
1319	0603123N	17	FORCE PROTECTION ADVANCED TECHNOLOGY	82,130	27,500	109,630
			High temp superconductor (HTS) synchronous Navy propulsion motor		[7,000]	
			Development of wide bandgap semiconductor materials		[6,000]	
			Wave Power Demonstration Project		[4,000]	
			Composite twisted rudder		[1,000]	
			Tactical aircraft directed IR countermeasures		[7,000]	
			Steel sandwich panel qualification		[2,500]	
1319	0603235N	18	COMMON PICTURE ADVANCED TECHNOLOGY	79,521	3,000	82,521
			Consolidated undersea situational awareness		[3,000]	
1319	0603236N	19	WARFIGHTER SUSTAINMENT ADVANCED TECHNOLOGY	61,103	17,000	78,103
			Automatic container and cargo handling systems		[4,000]	
			Ultrasonic consolidation of matrix composites		[2,000]	
			Expeditionary logistics for the 21st Century		[6,000]	
			Defense Systems Modernization and Sustainment Initiative		[5,000]	
1319	0603271N	20	RF SYSTEMS ADVANCED TECHNOLOGY	44,046	3,000	47,046
			Real time precision targeting radar		[3,000]	
1319	0603640M	21	USMC ADVANCED TECHNOLOGY DEMONSTRATION (ATD)	58,222	9,000	67,222
			Unmanned tactical combat vehicle		[1,000]	
			Water purification research		[8,000]	
1319	0603712N	22	ENVIRONMENTAL QUALITY AND LOGISTICS ADVANCED TECHNOLOGY			
1319	0603727N	23	NAVY TECHNICAL INFORMATION PRESENTATION SYSTEM	167,626		167,626
1319	0603729N	24	WARFIGHTER PROTECTION ADVANCED TECHNOLOGY	16,719	2,600	19,319
			Anti-oxidant micronutrients research		[600]	
			Battlefield pharmaceutical test		[2,000]	

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
1319	0603747N	25	UNDERSEA WARFARE ADVANCED TECHNOLOGY	26,515		26,515
1319	0603757N	26	JOINT WARFARE EXPERIMENTS	26		26
1319	0603758N	27	NAVY WARFIGHTING EXPERIMENTS AND DEMONSTRATIONS	16,006		16,006
1319	0603782N	28	MINE AND EXPEDITIONARY WARFARE ADVANCED TECHNOLOGY	32,899		32,899
1319	0603792N	29	ADVANCED TECHNOLOGY TRANSITION			
1319	0603207N	30	AIR/OCEAN TACTICAL APPLICATIONS	24,431		24,431
1319	0603216N	31	AVIATION SURVIVABILITY	10,820	5,500	16,320
			Rotorcraft External Airbag System		[5,500]	
1319	0603237N	32	DEPLOYABLE JOINT COMMAND AND CONTROL	42,394		42,394
1319	0603254N	33	ASW SYSTEMS DEVELOPMENT	4,541	5,000	9,541
			Claymore marine		[5,000]	
1319	0603261N	34	TACTICAL AIRBORNE RECONNAISSANCE	6,448		6,448
1319	0603382N	35	ADVANCED COMBAT SYSTEMS TECHNOLOGY	67,605		67,605
1319	0603502N	36	SURFACE AND SHALLOW WATER MINE COUNTERMEASURES	103,308		103,308
1319	0603506N	37	SURFACE SHIP TORPEDO DEFENSE	46,896		46,896
1319	0603512N	38	CARRIER SYSTEMS DEVELOPMENT	157,479	9,000	166,479
			Aviation Ship Integration Center		[9,000]	
1319	0603513N	39	SHIPBOARD SYSTEM COMPONENT DEVELOPMENT	18,993	3,000	21,993
			Amorphous metal permanent magnet generator set		[3,000]	
1319	0603525N	40	PILOT FISH	78,223		78,223
1319	0603527N	41	RETRACT LARCH	82,532		82,532
1319	0603536N	42	RETRACT JUNIPER	36,915		36,915
1319	0603542N	43	RADIOLOGICAL CONTROL	946		946

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
1319	0603553N	44	SURFACE ASW	17,633	5,800	23,433
			Surface ship combat systems warfare enhancements		[3,000]	
			Improved surface vessel torpedo launcher		[2,800]	
1319	0603559N	45	SSGN CONVERSION	19,970		19,970
1319	0603561N	46	ADVANCED SUBMARINE SYSTEM DEVELOPMENT	81,160	10,000	91,160
			Submarine payloads and sensors		[10,000]	
1319	0603562N	47	SUBMARINE TACTICAL WARFARE SYSTEMS	5,957		5,957
1319	0603563N	48	SHIP CONCEPT ADVANCED DESIGN	3,723	5,000	8,723
			Integrated Condition Assessment System		[5,000]	
1319	0603564N	49	SHIP PRELIMINARY DESIGN & FEASIBILITY STUDIES			
1319	0603570N	50	ADVANCED NUCLEAR POWER SYSTEMS	169,733		169,733
1319	0603573N	51	ADVANCED SURFACE MACHINERY SYSTEMS			
1319	0603576N	52	CHALK EAGLE	47,786		47,786
1319	0603581N	53	LITTORAL COMBAT SHIP (LCS)	352,089		352,089
1319	0603582N	54	COMBAT SYSTEM INTEGRATION	80,840	-5,000	75,840
			Context-adaptable autonomous and remote unmanned systems		[5,000]	
			Transfer to PE 64503N (RDN 108)		[-10,000]	
1319	0603609N	55	CONVENTIONAL MUNITIONS	34,151		34,151
1319	0603611M	56	MARINE CORPS ASSAULT VEHICLES	236,969		236,969
1319	0603612M	57	USMC MINE COUNTERMEASURES SYSTEMS - ADV DEV	4,522		4,522

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
1319	0603635M	58	MARINE CORPS GROUND COMBAT/SUPPORT SYSTEM	22,440	16,700	39,140
			Urban operations environmental laboratory		[6,400]	
			Urban operations nonlethal and scalable weaponization		[2,900]	
			Clearing facilities with novel technology		[3,400]	
			Anti-Armor Weapon System - Heavy		[4,000]	
1319	0603654N	59	JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMENT	18,047		18,047
1319	0603658N	60	COOPERATIVE ENGAGEMENT	103,452		103,452
1319	0603713N	61	OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT	26,232		26,232
1319	0603721N	62	ENVIRONMENTAL PROTECTION	24,641	3,000	27,641
			Marine mammal detection and mitigation		[3,000]	
1319	0603724N	63	NAVY ENERGY PROGRAM	1,494	3,000	4,494
			Proton exchange membrane (PEM) fuel cell trial		[3,000]	
1319	0603725N	64	FACILITIES IMPROVEMENT	1,621		1,621
1319	0603734N	65	CHALK CORAL	58,467		58,467
1319	0603739N	66	NAVY LOGISTIC PRODUCTIVITY	7,421		7,421
1319	0603746N	67	RETRACT MAPLE	275,407		275,407
1319	0603748N	68	LINK PLUMERIA	112,997		112,997
1319	0603751N	69	RETRACT ELM	48,130		48,130
1319	0603755N	70	SHIP SELF DEFENSE	9,493		9,493
1319	0603764N	71	LINK EVERGREEN	63,346		63,346
1319	0603787N	72	SPECIAL PROCESSES	44,232		44,232
1319	0603790N	73	NATO RESEARCH AND DEVELOPMENT	10,151		10,151
1319	0603795N	74	LAND ATTACK TECHNOLOGY	82,049	-28,900	53,149
			Reduction - Affordable Weapons System		[-28,900]	

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
1319	0603851M	75	NONLETHAL WEAPONS	43,321		43,321
1319	0603857N	76	ALL SERVICE COMBAT IDENTIFICATION EVALUATION TEAM (ASCIET)	13,626		13,626
1319	0603860N	77	JOINT PRECISION APPROACH AND LANDING SYSTEMS	32,391		32,391
1319	0603879N	78	SINGLE INTEGRATED AIR PICTURE (SIAP) SYSTEM ENGINEER (SE)	20,252		20,252
1319	0603889N	79	COUNTERDRUG RDT&E PROJECTS			
1319	0604272N	80	TACTICAL AIR DIRECTIONAL INFRARED COUNTERMEASURES (TADIRCM)			
1319	0604707N	81	SPACE AND ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING S	25,943		25,943
1319	0604787N	82	JOINT WARFARE TRANSFORMATION PROGRAMS	22,450		22,450
1319	0604212N	83	OTHER HELO DEVELOPMENT	186,970		186,970
1319	0604214N	84	AV-8B AIRCRAFT - ENG DEV	12,284		12,284
1319	0604215N	85	STANDARDS DEVELOPMENT	57,675		57,675
1319	0604216N	86	MULTI-MISSION HELICOPTER UPGRADE DEVELOPMENT	78,757		78,757
1319	0604217N	87	S-3 WEAPON SYSTEM IMPROVEMENT			
1319	0604218N	88	AIR/OCEAN EQUIPMENT ENGINEERING	4,506		4,506
1319	0604221N	89	P-3 MODERNIZATION PROGRAM	9,554		9,554
1319	0604230N	90	WARFARE SUPPORT SYSTEM	5,201		5,201
1319	0604231N	91	TACTICAL COMMAND SYSTEM	49,180		49,180
1319	0604234N	92	ADVANCED HAWKEYE	597,015		597,015
1319	0604245N	93	H-1 UPGRADES	90,389	42,000	132,389
			AH-1Z/UH-1Y upgrades - turned exhaust		[42,000]	
1319	0604261N	94	ACOUSTIC SEARCH SENSORS	13,363		13,363
1319	0604262N	95	V-22A	304,164		304,164
1319	0604264N	96	AIR CREW SYSTEMS DEVELOPMENT	8,838	4,000	12,838
			Joint Helmet Mounted Cueing System Quad Eye		[4,000]	

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
1319	0604269N	97	EA-18	357,502		357,502
1319	0604270N	98	ELECTRONIC WARFARE DEVELOPMENT	48,956		48,956
1319	0604273N	99	VHXX EXECUTIVE HELO DEVELOPMENT	777,398	-145,000	632,398
			VXX executive helicopter execution		[-145,000]	
1319	0604280N	100	JOINT TACTICAL RADIO SYSTEM - NAVY (JTRS-NAVY)	78,624		78,624
1319	0604300N	101	SC-21 TOTAL SHIP SYSTEM ENGINEERING	1,431,585	99,400	1,530,985
			For second DD(X)		[99,400]	
1319	0604307N	102	SURFACE COMBATANT COMBAT SYSTEM ENGINEERING	146,463		146,463
1319	0604311N	103	LPD-17 CLASS SYSTEMS INTEGRATION	8,988		8,988
1319	0604312N	104	TRI-SERVICE STANDOFF ATTACK MISSILE	27,047		27,047
1319	0604329N	105	SMALL DIAMETER BOMB (SDB)	9,961		9,961
1319	0604366N	106	STANDARD MISSILE IMPROVEMENTS	99,022	10,000	109,022
			Standard missile insensitive munitions improvements		[5,000]	
			Advanced missile data Link		[5,000]	
1319	0604373N	107	AIRBORNE MCM	50,514	3,000	53,514
			Surface Navy integrated undersea tactical technology (SNUITT) sim		[3,000]	
1319	0604503N	108	SSN-688 AND TRIDENT MODERNIZATION	75,359	14,000	89,359
			Submarine expendable communication device		[4,000]	
			Transfer from PE 63582N (RDN 54)		[10,000]	
1319	0604504N	109	AIR CONTROL	13,102		13,102
1319	0604507N	110	ENHANCED MODULAR SIGNAL PROCESSOR	1,075		1,075
1319	0604512N	111	SHIPBOARD AVIATION SYSTEMS	28,631	2,500	31,131
			Synthetic material arresting cable		[2,500]	
1319	0604518N	112	COMBAT INFORMATION CENTER CONVERSION	8,228		8,228

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
1319	0604558N	113	NEW DESIGN SSN	143,270	76,100	219,370
			Submarine information assurance		[2,000]	
			Multi-mission module		[56,000]	
			Large aperture bow array		[5,000]	
			Common submarine radio room		[13,100]	
1319	0604561N	114	SSN-21 DEVELOPMENTS	3,020		3,020
1319	0604562N	115	SUBMARINE TACTICAL WARFARE SYSTEM	43,404	6,000	49,404
			Submarine warfare system strike weapon status control		[6,000]	
1319	0604567N	116	SHIP CONTRACT DESIGN/ LIVE FIRE T&E	130,908		130,908
1319	0604574N	117	NAVY TACTICAL COMPUTER RESOURCES	2,381		2,381
1319	0604601N	118	MINE DEVELOPMENT	6,123		6,123
1319	0604603N	119	UNGUIDED CONVENTIONAL AIR-LAUNCHED WEAPONS			
1319	0604610N	120	LIGHTWEIGHT TORPEDO DEVELOPMENT	9,965		9,965
1319	0604618N	121	JOINT DIRECT ATTACK MUNITION			
1319	0604654N	122	JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMENT	8,081		8,081
1319	0604703N	123	PERSONNEL, TRAINING, SIMULATION, AND HUMAN FACTORS	3,005		3,005
1319	0604710N	124	NAVY ENERGY PROGRAM			
1319	0604721N	125	BATTLE GROUP PASSIVE HORIZON EXTENSION SYSTEM	17,981	3,000	20,981
			Anti-terrorism Tech Surveillance System		[3,000]	
1319	0604727N	126	JOINT STANDOFF WEAPON SYSTEMS	9,531		9,531
1319	0604755N	127	SHIP SELF DEFENSE (DETECT & CONTROL)	48,154	5,000	53,154
			Directed energy user scrutiny equipment		[5,000]	
1319	0604756N	128	SHIP SELF DEFENSE (ENGAGE: HARD KILL)	51,213		51,213

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
1319	0604757N	129	SHIP SELF DEFENSE (ENGAGE: SOFT KILL/EW)	28,233	5,000	33,233
			NULKA research to counter multi-mode RF and IR		[5,000]	
1319	0604771N	130	MEDICAL DEVELOPMENT	6,942	3,000	9,942
			Sea rescue technology		[3,000]	
1319	0604777N	131	NAVIGATION/ID SYSTEM	28,104		28,104
1319	0604784N	132	DISTRIBUTED SURVEILLANCE SYSTEM	7,776		7,776
1319	0604800N	133	JOINT STRIKE FIGHTER (JSF)	2,264,507	15,000	2,279,507
			STOVL lift fan study		[15,000]	
1319	0604910N	134	SMART CARD	695		695
1319	0605013M	135	INFORMATION TECHNOLOGY DEVELOPMENT	9,301		9,301
1319	0605013N	136	INFORMATION TECHNOLOGY DEVELOPMENT	109,543		109,543
1319	0605014N	137	DEFENSE INTEGRATED MILITARY HUMAN RESOURCES SYSTEM (DIMHRS) -			
1319	0605500N	138	MULTI-MISSION MARITIME AIRCRAFT (MMA)	496,029		496,029
1319	0508713N	139	NAVY STANDARD INTEGRATED PERSONNEL SYSTEM (NSIPS)			
1319	0604256N	140	THREAT SIMULATOR DEVELOPMENT	23,866		23,866
1319	0604258N	141	TARGET SYSTEMS DEVELOPMENT	35,677		35,677
1319	0604759N	142	MAJOR T&E INVESTMENT	39,787		39,787
1319	0605152N	143	STUDIES AND ANALYSIS SUPPORT - NAVY	2,183		2,183
1319	0605154N	144	CENTER FOR NAVAL ANALYSES	43,982		43,982
1319	0605155N	145	FLEET TACTICAL DEVELOPMENT	2,338		2,338
1319	0605502N	146	SMALL BUSINESS INNOVATIVE RESEARCH			
1319	0605804N	147	TECHNICAL INFORMATION SERVICES	696		696
1319	0605853N	148	MANAGEMENT, TECHNICAL & INTERNATIONAL SUPPORT	31,407		31,407
1319	0605856N	149	STRATEGIC TECHNICAL SUPPORT	3,493		3,493

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
1319	0605861N	150	RDT&E SCIENCE AND TECHNOLOGY MANAGEMENT	66,117	-3,800	62,317
			Unjustified growth		[-3,800]	
1319	0605862N	151	RDT&E INSTRUMENTATION MODERNIZATION	19,370		19,370
1319	0605863N	152	RDT&E SHIP AND AIRCRAFT SUPPORT	81,308		81,308
1319	0605864N	153	TEST AND EVALUATION SUPPORT	255,926		255,926
1319	0605865N	154	OPERATIONAL TEST AND EVALUATION CAPABILITY	13,044		13,044
1319	0605866N	155	NAVY SPACE AND ELECTRONIC WARFARE (SEW) SUPPORT	2,941		2,941
1319	0605867N	156	SEW SURVEILLANCE/RECONNAISSANCE SUPPORT	12,160		12,160
1319	0605873M	157	MARINE CORPS PROGRAM WIDE SUPPORT	19,701		19,701
1319	0909999N	158	FINANCING FOR CANCELLED ACCOUNT ADJUSTMENTS			
1319	0603660N	159	ADVANCED DEVELOPMENT PROJECTS	[ ]		
1319	0603661N	160	RETRACT VIOLET	[ ]		
1319	0101221N	161	STRATEGIC SUB & WEAPONS SYSTEM SUPPORT	108,782	5,000	113,782
			Thin-plate pure lead battery technology		[5,000]	
1319	0101224N	162	SSBN SECURITY TECHNOLOGY PROGRAM	43,408		43,408
1319	0101226N	163	SUBMARINE ACOUSTIC WARFARE DEVELOPMENT	8,453		8,453
1319	0101402N	164	NAVY STRATEGIC COMMUNICATIONS	31,391		31,391
1319	0203761N	165	RAPID TECHNOLOGY TRANSITION (RTT)	14,630		14,630
1319	0204136N	166	F/A-18 SQUADRONS	134,580		134,580
1319	0204152N	167	E-2 SQUADRONS	6,055		6,055
1319	0204163N	168	FLEET TELECOMMUNICATIONS (TACTICAL)	19,784		19,784
1319	0204229N	169	TOMAHAWK AND TOMAHAWK MISSION PLANNING CENTER (TMPC)	28,776	5,000	33,776
			Precision Terrain Aided Navigation		[5,000]	
1319	0204311N	170	INTEGRATED SURVEILLANCE SYSTEM	16,965		16,965

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
1319	0204413N	171	AMPHIBIOUS TACTICAL SUPPORT UNITS (DISPLACEMENT CRAFT)	2,604		2,604
1319	0204571N	172	CONSOLIDATED TRAINING SYSTEMS DEVELOPMENT	21,644		21,644
1319	0204574N	173	CRYPTOLOGIC DIRECT SUPPORT	1,460		1,460
1319	0204575N	174	ELECTRONIC WARFARE (EW) READINESS SUPPORT	12,139		12,139
1319	0205601N	175	HARM IMPROVEMENT	163,371		163,371
1319	0205604N	176	TACTICAL DATA LINKS	18,977		18,977
1319	0205620N	177	SURFACE ASW COMBAT SYSTEM INTEGRATION	10,612		10,612
1319	0205632N	178	MK-48 ADCAP	21,620		21,620
1319	0205633N	179	AVIATION IMPROVEMENTS	62,635	4,000	66,635
			Corrosion inhibiting coatings		[4,000]	
1319	0205658N	180	NAVY SCIENCE ASSISTANCE PROGRAM	3,821		3,821
1319	0205675N	181	OPERATIONAL NUCLEAR POWER SYSTEMS	64,554		64,554
1319	0206313M	182	MARINE CORPS COMMUNICATIONS SYSTEMS	268,638	3,800	272,438
			Communication emitter sensing and attacking system		[3,800]	
1319	0206623M	183	MARINE CORPS GROUND COMBAT/SUPPORTING ARMS SYSTEMS	44,828		44,828
1319	0206624M	184	MARINE CORPS COMBAT SERVICES SUPPORT	10,731	2,000	12,731
			Battlefield Management System		[2,000]	
1319	0207161N	185	TACTICAL AIM MISSILES	4,061		4,061
1319	0207163N	186	ADVANCED MEDIUM RANGE AIR-TO-AIR MISSILE (AMRAAM)	9,085		9,085
1319	0301303N	187	MARITIME INTELLIGENCE	[ ]		
1319	0301323N	188	COLLECTION MANAGEMENT	[ ]		
1319	0301327N	189	TECHNICAL RECONNAISANCE AND SURVEILLANCE	[ ]		
1319	0303109N	190	SATELLITE COMMUNICATIONS (SPACE)	573,092		573,092
1319	0303140N	191	INFORMATION SYSTEMS SECURITY PROGRAM	18,676		18,676

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
1319	0304111N	192	SPACE ACTIVITIES	[ ]		
1319	0305149N	193	COBRA JUDY	80,694	13,000	93,694
			Cobra Judy replacement		[13,000]	
1319	0305160N	194	NAVY METEOROLOGICAL AND OCEAN SENSORS-SPACE (METOC)	4,215		4,215
1319	0305188N	195	JOINT C4ISR BATTLE CENTER (JBC)	43,569		43,569
1319	0305192N	196	JOINT MILITARY INTELLIGENCE PROGRAMS	4,746		4,746
1319	0305204N	197	TACTICAL UNMANNED AERIAL VEHICLES (JMIP)	53,439		53,439
1319	0305205N	198	ENDURANCE UNMANNED AERIAL VEHICLES	113,438		113,438
1319	0305206N	199	AIRBORNE RECONNAISSANCE SYSTEMS	10,191		10,191
1319	0305207N	200	MANNED RECONNAISSANCE SYSTEMS (JMIP)	20,203		20,203
1319	0305208N	201	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS	3,635		3,635
1319	0305927N	202	NAVAL SPACE SURVEILLANCE			
1319	0307207N	203	AERIAL COMMON SENSOR (ACS) (JMIP)	24,909		24,909
1319	0308601N	204	MODELING AND SIMULATION SUPPORT	7,262	9,000	16,262
			Modeling and simulation research		[9,000]	
1319	0702207N	205	DEPOT MAINTENANCE (NON-IF)			
1319	0708011N	206	INDUSTRIAL PREPAREDNESS	56,565		56,565
1319	0708730N	207	MARITIME TECHNOLOGY (MARITECH)	10,265		10,265
1319	XXXXXXXXX	999	CLASSIFIED PROGRAMS	1,003,485		1,003,485
			Financial information systems		-15,200	-15,200
			Total, RDT&E Navy	**16,346,391**	**333,000**	**16,679,391**

Navy university research

The budget request included $83.5 million in PE 61103N for the Navy University Research Initiatives program. The committee notes that basic research investments made by the Office of Naval Research have contributed greatly to the technological dominance enjoyed by our nation's military. These investments have been both militarily relevant, leading to the development of radars, stealth, and unmanned systems, and scientifically revolutionary, supporting the work of over 50 Nobel Prize winners. The committee recommends an increase of $17.0 million in PE 61103N: $5.0 million for multifunctional materials for naval structures, such as energy absorbing ship hulls; $1.5 million to perform nanoparticles materials research on coatings geared toward reduced fuel usage and combating abrasion damage; $5.0 million for corrosion research, a continuing and expensive challenge for the Navy; $1.5 million for neural engineering research at the intersection of engineering, computer science, and neural science, with an emphasis on increasing human-machine interfaces and perfecting remote operations; $1.0 million for basic remote sensing research; and $3.0 million for research in basic nanoscience and nanomaterials focused on properties and performance characteristics for naval applications.

The committee notes that the Navy is in the process of reviewing investments in basic research. The committee expects the Navy to continue its traditional support of truly fundamental, revolutionary research in academia, industry, and government laboratories focused on discovery and innovation as it conducts this review.

Navy science and technology outreach

The Office of Naval Research initiated a program in fiscal year 2003 to revitalize the science and technology (S&T) capabilities of the Navy's research and development centers. The budget request included $17.7 million in PE 61152N for In-House Laboratory Independent Research, which supports the Navy's S&T capability initiative. The committee recommends an increase in PE 61152N of $2.5 million to support a new pilot program—the Naval Research Science and Technology for America's Readiness (N-Star) program. The N-Star program would focus on outreach opportunities in high schools and middle schools, and leverage the resources and expertise available in Navy facilities to engage and mentor students who have science and engineering aptitude and interests.

Applied force protection technologies

The budget request included $96.3 million in PE 62123N for force protection applied research. To accelerate development of protection and situational awareness technologies, the committee recommends an increase in PE 62123N of $15.0 million: $2.0 million for polymer aircraft components; $4.0 million for hyperspectral data fusion; $4.0 million for the development of novel materials to support high-speed theater support vessels; $1.0 million for low-cost hybrid fire retardant resins; $1.0 million for structural reliability composite research to address Navy challenges in consistent, reliable, production of large parts with inherent material property variability; and $3.0 million for battery development, specifically for unmanned systems. The committee notes that the Navy

and the Office of Force Transformation are working closely to explore the development of unmanned platforms and their potential contribution to the deployment of truly networked, agile forces.

Warfighter sustainment applied research

The budget request included $63.7 million in PE 62236N for warfighter sustainment applied research. The committee recommends an increase in PE 62236N of $23.0 million to accelerate the Navy's pursuit of future naval capabilities in the areas of expeditionary logistics and innovation-based efforts in warfighter protection and power projection. Of this amount, the committee recommends an increase of $2.0 million for advanced aerospace alloy research; $2.0 million for titanium materials research; $2.0 million for microsystem fuze, safe and arm devices, currently outpaced by weapons requirements; $12.0 million for the SensorNet system to incorporate legacy systems and new technologies into a common data architecture for detection, interdiction, and comprehensive incident management to meet a five-minute response objective; $2.5 million for highly sensitive biowarfare detectors; and $2.5 million for infectious disease analysis, geared toward development of tools for rapid detection, treatment, and triage of individuals infected as a result of exposure to biological agents and pathogens.

Radio frequency systems applied research

The budget request included $49.2 million in PE 62271N for radio frequency systems applied research. The radio frequency (RF) systems applied research program addresses technology deficiencies associated with naval platform needs, and supports development of technologies to enable missile defense, directed energy, platform protection, time critical strike, and information distribution. The committee recommends an increase in PE 62271N of $2.0 million for high brightness electron sources for vacuum electronics applications in support of radiation resistant communications needs.

Radio frequency systems applied research projects also support electronic warfare, communications and navigation missions. The committee recommends an increase in PE 62271N of $1.5 million for wide bandgap silicon carbide semiconductor research, which would enable updated radar systems required by the Navy and Marine Corps.

Integrated littoral sensor network

The budget request included $48.5 million in PE 62435N for the ocean warfighting environment applied research. Real time knowledge of the Battlespace Environment (BSE) is a key capability required by the Navy's three transformational capabilities: Sea Strike, Sea Shield, and Sea Basing. The committee recommends an increase in PE 62435N of $2.0 million for the integrated littoral sensor network, which is designed to provide a portable suite of sensors, models and informatics techniques for detection, diagnosis, and predictions of man-made and natural water-borne hazards and threats, supporting the Navy's need for real time knowledge of the battlespace.

Low acoustic propulsion

The budget request included $64.1 million in PE 62747N for ocean warfighting environment applied research. The committee recommends an increase in PE 62747N of $1.0 million for low acoustic propulsion research to upgrade the existing torpedo inventory to a safer, lower cost electric propulsion system with improved stealth capabilities.

Free electron laser

The budget request included $92.4 million in PE 63114N for power projection advanced technology. The committee recommends an increase in PE 63114N of $9.0 million for acceleration and demonstration of the high power free electron laser (FEL). The Navy has identified free electron lasers as a possible future directed energy weapon for the defense of Navy assets. The committee commends the Navy for its support of the FEL program and, expects the Office of Naval Research to fully fund the ongoing program to reach weapons grade power levels.

The committee recommends a decrease in PE 63114N of $5.0 million for aerospace research programs that have grown more rapidly than warranted, given Navy requirements in this area.

Force Protection Advanced Technology

The budget request included $82.1 million in PE 63123N for force protection advanced technology, but included no funding for the following six initiatives: (1) power generating buoys; (2) high temperature superconducting alternating current (HTS AC) synchronous motor; (3) tactical aircraft directed infrared countermeasures (TADIRCM); (4) composite twisted rudder; (5) wide bandgap semiconductor materials; and (6) steel sandwich panels.

There continues to be a need for reliable sources of non-polluting electric power generating capability for remote Navy sites around the world. The Navy has been investigating technologies based on power generating buoys that could be easily deployed to expeditionary sites. These buoys could enable the Navy to tap an infinitely renewable energy source of wave power when in situations where building more conventional generating capacity is not possible or practical. The committee recommends an additional $4.0 million in PE 63123N for improving and demonstrating wave power technology.

The Navy is working on the electric warship program to address electrical and auxiliary system component technology to provide improvements in system energy and power density, system operating efficiency and the ability to recover from casualties. The Navy is shifting to integrated electric propulsion approaches for the fleet, most notably in the DD(X) destroyer program. A HTS AC synchronous motor and generator hold the potential to be much smaller, quieter and less expensive than alternative systems. The committee believes that the Navy should continue development efforts on a large scale HTS AC synchronous motor to determine whether such a motor could serve as a central component of a propulsion system. Therefore, the committee recommends an additional $7.0 million in PE 63123N to build and begin testing a DD(X)-size HTS AC synchronous motor.

The Navy has been investigating the potential for employing directed infrared countermeasures (DIRCM) technologies on its tactical aircraft. Such systems would be used to defeat IR-guided surface-to-air missiles. The committee understands that the Naval Air Systems Command has structured a program proposal that would incorporate a TADIRCM system within a derivative of an existing tactical aircraft pod. The proposal would include flight testing as a risk reduction effort before the planned start of system design and demonstration. The committee believes that it is important to increase the self-protection capability of our tactical aircraft, and recommends an increase of $7.0 million in PE 63123N for this effort.

There is a potential for fuel savings by outfitting surface combatants with composite rudders that are built with a surface that is non-planar, known as a twisted rudder. Navy model testing of this design indicates that the Navy might achieve significant annual fuel savings by outfitting its surface combatants with rudders built to this new design. To verify the model testing, the Navy needs to build a ship set of full-scale twisted rudders and install them on a destroyer. The committee recommends an increase of $1.0 million in PE 63123N to build and install a full-scale ship set of twisted rudders.

Advanced power electronics needed for many Department of Defense systems depend on the development of wide bandgap (WBG) semiconductor materials capable of significantly higher power, higher frequency at higher operating temperature, and greater efficiencies. These devices could have broad applications in such systems as radars for surface ships and aircraft. These devices could be less expensive if wafer production processes could be improved. Since reducing the recurring costs of these semiconductors would have a significant effect on costs of important weapons systems, the committee recommends an additional $6.0 million in PE 63123N for developing better wide bandgap semiconductors production processes.

The committee understands that an effort is underway within the Navy to develop methods for using steel sandwich panels to reduce weight in ships. The committee believes that this technology holds great potential for cost reduction and performance enhancement. The committee recommends an increase of $2.5 million in PE 63123N to develop and qualify advanced steel sandwich panels for the construction of appropriate sections of Navy ships.

In total, the committee recommends an authorization of $109.6 million in PE 63123N.

Common picture advanced technology

The budget request included $79.5 million in PE 63235N for common picture advanced technology. The use of intelligent software agents is a major new tool for the Navy that provides timely, effective, and efficient decision support under conditions of great uncertainty. The committee recommends an increase in PE 63235N of $3.0 million for a consolidated undersea situational awareness tool, which provides information superiority through precise decision making aids.

Warfighter sustainment advanced technology

The budget request included $61.1 million in PE 63236N for warfighter sustainment advanced technology, including some funding for efforts associated with expeditionary logistics, but no funding for: (1) automatic container and cargo handling systems; (2) ultrasonic consolidation of matrix composites; or (3) defense system modernization and sustainment initiative.

The expeditionary logistics investment is intended to develop and improve transformational Naval surface distribution/replenishment techniques, and to improve the situational awareness of readiness and operating logistics status. The committee believes that the Navy might be able to employ software products that use decision support planning tools to process timely, accurate information on tactical equipment and weapons system on the battlefield. Such tools could support decision making by accurately modeling and predicting failure of important expeditionary systems. Therefore, the committee recommends an increase of $6.0 million in PE 63236N for continuing this development effort.

An automated cargo and container handling system would provide the Navy with a capability of offloading supply ships in support of sea-based operations. The system would use multi-point stabilization to overcome the dangerous pendulum effect that can plague existing shipboard cranes. The committee recommends an increase of $4.0 million in PE 63236N to develop, fabricate, and test an automated container and cargo handling system capable of operating in sea states of up to sea state three.

The Navy is developing a number of weapons systems that seek to employ metal matrix composite materials. In order to make these materials more affordable, the Navy needs to develop new technologies and production processes. One of these potential approaches would employ ultrasonic energy to consolidate these metal matrix composites during fabrication. Therefore, the committee recommends an increase of $2.0 million in PE 63236N for developing ultrasonic consolidation techniques for producing metal matrix composites.

Under the defense systems modernization and sustainment initiative, the Office of Naval Research (ONR) has been conducting developments in four specific focus areas: (1) material aging; (2) life cycle engineering and economic decision system; (3) asset health management; and (4) reliability, availability, and maintainability initiative. The objective of these efforts is to develop processes and tools to track the status and likely future health of systems and, in so doing, detect and diagnose potential equipment failures before they could cause problems in the execution of missions. This effort is also intended to produce decision support systems that would provide greater insight into when the Navy should upgrade weapons and support systems. The committee recommends an additional $5.0 million in PE 63236N to continue these efforts.

The committee recommends a total authorization of $78.1 million in PE 63236N.

Precision targeting radar

The budget request included $44.0 million in PE 63271N for radio frequency advanced technology. The committee recommends

an increase in PE 63271N of $3.0 million for a real time precision targeting radar system under development to update current systems with wideband surface capabilities for all-weather surveillance, detection, and location of time critical targets. The program will increase the number of test flight hours and add software for surface target identification.

Water purification demonstration

The budget request included $58.2 million in PE 63640M for Marine Corps advanced technology demonstrations. Air deliverable, high capacity water purification systems meet a critical need during all military missions. Research on high efficiency, compact technology will help alleviate the significant logistical load of transporting water. The committee recommends an increase in PE 63640M of $8.0 million for demonstration of the expeditionary warfare water purification system.

Anti-oxidant micronutrients

The budget request included $16.7 million in PE 63729N for warfighter protection advanced technology. This project supports the development and demonstration of field medical equipment: diagnostic capabilities and treatments; technologies to improve warfighter safety and to enhance personnel performance under adverse conditions; and systems to prevent occupational injury and disease in hazardous deployment environments. Anti-oxidant micronutrients provide protection for the warfighter against physical stress, environmental exposures, and hazardous agents in combat operations. The committee recommends an increase in PE 63729N of $600,000 for anti-oxidant micronutrients for warfighter protection and $2.0 million for battlefield pharmaceutical tests, to complete preclinical trial testing on a technology to enhance the body's ability to use available blood oxygen, preventing shock, and providing increased life-saving potential for victims who experience severe blood loss injuries.

Rotorcraft external airbag protection system

The budget request included $10.8 million in PE 63216N for aviation survivability developments, but included no funding for the development of the rotorcraft external airbag protection system (REAPS). The committee continues to support this system for its potential to make helicopter crashes more survivable, and recommends an increase of $5.5 million in PE 63216N for the continued development of REAPS.

Anti-submarine warfare systems development

The budget request included $4.5 million in PE 63254N for anti-submarine warfare (ASW) systems development, but included no funds for the Claymore Marine program. This program was established to investigate and demonstrate a new littoral ASW system that provides significant increase in capability using existing hardware and a classified algorithm. The algorithm is implemented for real time processing onboard the host system, and has been modified for mine detection in addition to airborne ASW. The committee

recommends an increase of $5.0 million in PE 63254N for the Claymore Marine program.

Carrier systems development

The budget request included $157.5 million in PE 63512N for carrier systems development, but included no funding for the Aviation Ship Integration Center. This center provides an environment that supports the development and conceptualization of fully integrated future aircraft carrier advanced technology design. The center is focused on reducing costs by increasing efficiencies in air capable shipbuilding programs. The Chief of Naval Operations has included the funding for this center on his Unfunded Priority List. The committee recommends an increase of $9.0 million in PE 63512N for the Aviation Ship Integration Center.

Amorphous metal permanent magnet generator set

The budget request included $19.0 million in PE 63513N for shipboard system component developments, including $4.1 million for integrated power systems development.

The committee understands that generator sets employing amorphous metal permanent magnets have the potential to greatly increase power output, while reducing the size and weight of the generator set. Such generator technology also holds the potential for reducing life cycle costs by increasing fuel efficiency and reducing logistics support costs.

The committee believes that the Navy should explore this promising technology, and recommends an increase of $3.0 million in PE 63513N for prototype development and testing of an amorphous metal permanent magnet generator set.

Surface ship combat systems warfighting enhancements

The budget request included $17.6 million in PE 63553N for surface ship anti-submarine warfare development, but included no funding for surface ship combat systems that model the submarine advanced processor build (APB) program, or for an improved surface torpedo launcher.

Legacy surface ship combat systems employ standard hardware and software which is tailored to military specifications. Modifications and enhancements to meet threats in the contact-dense littoral and expeditionary warfare environments are prohibitively expensive due to the closed nature of existing architectures. The committee believes that surface combatants would benefit from integrating selected submarine APB products, and recommends an increase of $3.0 million in PE 63553N for this purpose.

The Navy has investigated the potential for a modular, gas generator launch canister for launching torpedos. This project uses commercial off-the-shelf (COTS), automobile-style airbags for launch energy. Employment of these COTS components could greatly reduce the burden of maintaining the current air flask-based torpedo tubes. The committee recommends an increase of $2.8 million in PE 63553N for this purpose.

Submarine payloads and sensors

The budget request included $81.2 million in PE 63561N for advanced submarine systems development, but included no funding to develop advanced payload and sensor systems. The advanced submarine systems development program incorporates the recommendations of the Defense Science Board that the Navy develop new capabilities for our submarine forces. While there are ongoing developments funded in this program, there is no opportunity for new technologies to be introduced. The committee recommends an increase of $10.0 million in PE 63561N to allow for new projects.

Integrated condition assessment system

The budget request included $3.7 million in PE 63563N for ship concept advanced design, but included no funding to develop and prototype additional hardware and software components to enhance the integrated condition assessment system (ICAS). Continuous enhancements would expand the capabilities of ICAS and reduce shipboard weight and space requirements. The committee recommends an increase of $5.0 million for ICAS development.

Combat systems integration

The budget request included $80.8 million in PE 63582N, for combat systems integration and battle force interoperability improvements. The request included $10.0 million for phase III of a small business innovative research (SBIR) project for an advanced processor build, but no funding to develop better systems to control autonomous and remotely controlled unmanned underwater vehicles (UUVs).

The committee has confirmed with the Navy that the SBIR phase III project for the advanced processor build should be executed in PE 64503N. Therefore, the committee recommends a decrease of $10.0 million in PE 63582N, for combat systems integration.

The Navy must operate current UUVs with multiple human-system interfaces (HSI) that greatly complicate training and reduce systems performance. With the Navy's significant emphasis on a large number of unmanned systems, the committee believes that the Navy should establish an effort to conduct research on advanced UUV HSI technology. The goal of this effort would be to develop a standardized set of UUV HSI open architecture software that includes applications programs for UUV control, data collection, and interaction. The committee recommends an increase of $5.0 million to establish a program to pursue these developments.

The committee recommends a total authorization of $75.8 million in PE 63582N, for combat systems integration and battle force interoperability.

Non-lethal weapons

The budget request included $22.4 million in PE 63635M, for Marine Corps ground combat and supporting arms systems, including $493,000 for the Anti-Armor Weapon System program, but no funding for non-lethal weapon development. These programs are developing and integrating hardware and software for utilization by Marine Air-Ground Expeditionary Forces.

Non-lethal weapon development includes urban operations non-lethal and scalable technology, research in support of clearing facilities with novel technology, and non-lethal weaponization. These initiatives aim to minimize collateral damage to infrastructure and personnel, while neutralizing facilities and the threats that might be posed to these facilities and the personnel that occupy them. The committee notes that the Commandant of the Marine Corps identified a fiscal year 2005 unfunded requirement for continued development of non-lethal weapons. The committee believes that the Marine Corps must have a broad range of responses to contain and manage emerging threats before, during, and after conflict, and do so with minimum collateral damage. Therefore, the committee supports these initiatives.

The committee recommends the following:

(1) an increase of $6.4 million for the non-lethal weapons urban operations laboratory to expand the assessment, analysis, neutralization, and development of capabilities to ensure minimum environmental and collateral damage with nontraditional and traditional capabilities;

(2) an increase of $3.4 million to conduct research in support of clearing facilities with novel technology; and

(3) an increase of $2.9 million for non-lethal technology weaponization to conduct additional research, education and training to meet the goals of modern non-lethal and scalable options for Marine Corps forces deployed around the world.

The committee notes that the recent Marine Corps' decision to procure the Improved Target Acquisition System to meet the Anti-Armor Weapon System-Heavy (AAWS–H) requirement did not allow the Marine Corps sufficient time to request fiscal year 2005 funding to support the effort. The Marine Corps has provided information to this committee that indicates this initiative will be addressed in the fiscal year 2006 budget submission. The committee understands that not funding this program in fiscal year 2005 will delay the procurement and fielding of a critical combat capability by a year. Therefore, the committee recommends an increase of $4.0 million for the continued development of the AAWS–H weapon system.

The committee recommends a total authorization of $39.1 million in PE 63635M.

Marine mammal detection and mitigation

The budget request included $24.6 million in PE 63721N for environmental protection. The committee recommends an increase of $3.0 million in PE 63721N for marine mammal detection and mitigation. The committee notes that this research will accelerate research and development of a prototype system that will detect the presence of marine mammals. With such a system, scientists will be able to track marine mammal movement using the data collected and help create a better understanding of marine mammal migration routes, population densities, and habits. Such a system will help the Navy to conduct active sonar training, while mitigating biologically significant disruptions to marine mammals.

Uninterruptible fuel cell

The budget request included $1.5 million in PE 63724N for the Navy energy program, but included no funding to demonstrate proton exchange membrane (PEM) fuel cell designs at Department of the Navy installations. The Navy is tri-service lead for the implementation of renewable and alternative energy systems across the entire Department of Defense.

Reliable electric power is important for providing continuing operations at key operating facilities. Microprocessor operations are particularly sensitive to short interruptions. A potential way of dealing with the problem on a facility-wide basis, rather than piecemeal, would be to supply loads through uninterruptible substations that could respond within a few milliseconds to outages. The committee understands that such a substation with appropriate response times could be feasible by developing proton exchange membrane (PEM) fuel cell designs. The committee recommends an increase of $3.0 million in PE 63724N to demonstrate the technical and economic viability of a set of PEM fuel cells and control unit in daily operation of a reliable, uninterruptible distributed generator at a power sensitive Navy facility.

Affordable weapons system

The budget request included $82.0 million in PE 63795N for land attack technology, including $28.9 million for the continued development of the affordable weapons system (AWS). The AWS is a commercial off-the-shelf (COTS) based land attack and strike missile that can loiter and be directed to the target by either the shooter or a forward observer.

Budget briefings provided by the Navy to the committee indicate that there is no validated requirement for the AWS, and that AWS is not a Navy program of record. Funds appropriated for the system in fiscal year 2004 are intended to be used to determine the feasibility of transitioning AWS from a technology demonstration to a program, with a decision point on whether or not to proceed with AWS as a program by the end of fiscal year 2005. In outlining the top concerns with AWS, the Navy included the following: (1) fiscal year 2003 initiatives have not been completed as of March 2004; (2) the technical maturity of AWS had not been demonstrated; and (3) whether the capability meets naval requirements or needs has not been determined. The committee also notes that AWS funding is not included in Navy budget documentation in the Future Years Defense Program.

The committee believes that further funding of AWS in fiscal year 2005 is premature, until the Navy decides on whether to pursue AWS as a program of record. Since the Navy believes this evaluation can be made with funds appropriated in prior years, the committee recommends a decrease of $28.9 million in PE 63795N for the AWS, for a total authorization of $53.1 million.

AH–1Z attack helicopter upgrade

The budget request included $90.4 million in PE 64245N, for the H–1 helicopter upgrade program. The H–1 upgrade program is currently in the engineering and manufacturing design phase with five remanufactured aircraft, including two AH–1Z attack helicopters

flying developmental test flights concentrating on handling qualities and envelope expansion.

The committee understands that during developmental flight testing, the AH–1Z aircraft experienced increased infrared signature and higher than expected structural stress due to engine exhaust hitting the tail boom. The Marine Corps has been working to reduce the infrared signature of the helicopter to increase helicopter survivability. Currently, a turned exhaust design is being developed as part of Operation Iraqi Freedom aviation survivability equipment. The committee notes that the turned exhaust design reduces the aircraft's overall infrared signature, and will greatly increase survivability, according to the Marine Corps. The committee recommends an increase of $42.0 million for the continued development of a turned exhaust system for the AH–1Z helicopter upgrade, for a total authorization of $132.4 million in PE 64245N.

Joint helmet mounted cueing system

The budget request included $8.8 million in PE 64264N for aircrew systems developments, but included no funding for the continued development of the joint helmet mounted cueing system (JHMCS). The JHMCS is currently in use by the Navy and the Air Force, but is not equipped with a night vision capability. The JHMCS enables aircrews to designate and train weapon sensors on air and land targets through turning their head instead of maneuvering their aircraft. It also enhances survivability in lethal threat environments by allowing the aircrew to be focusing outside of the cockpit. The potential to expand this capability to night operations exists by using a quad-eye night vision device, which the Navy intends to test in fiscal year 2004. The committee recommends an increase of $4.0 million in PE 64264N for the development of the JHMCS quad-eye.

VXX executive helicopter development

The budget request included $777.5 million in PE 64273N, for the development of the VXX executive helicopter. In December 2003, the Department of the Navy issued a Request For Proposal for a platform to replace the current fleet of presidential helicopters. The intent was to award a Systems Development and Demonstration (SDD) contract by May 2004 for the replacement platform. On March 23, 2004, the Navy announced its decision to extend the source selection schedule in an effort to pursue additional risk reduction and to discuss the technological maturity of the competing bids for the program. The committee was informed that source selection would occur in January 2005. The committee fully supports this program, but believes that existing fiscal year 2004 funding and requested fiscal year 2005 funding can not be fully executed, given this delay in source selection. Therefore, the committee recommends a reduction of $145.0 million in PE 64273N, to reflect a three month fiscal year 2005 delay in the development of the VXX executive helicopter.

Standard missile improvements

The budget request included $99.0 million in PE 64366N for various Standard Missile improvements.

The budget included no funding for technologies to make Standard Missiles more resistant to external stimuli, such as shipboard fires or explosions. Mature missile systems, such as the Standard Missile, do not include the latest insensitive munitions (IM) technologies that would increase the weapon's ability to avoid unintended detonations. The committee believes that the Navy should incorporate these newer IM technologies in the Standard Missile product line, particularly as the Navy begins development of a new, extended range version of the Standard Missile, the SM–6. The committee recommends an increase of $5.0 million in PE 64366N to develop IM technology for the Standard Missile.

The SM–6 is intended to engage targets at longer ranges than the currently available Standard Missile variants. This fact, in addition to the likely presence of jamming or a more severe electromagnetic environment, will require that the SM–6 missile have a more robust data link. The committee recommends an increase of $5.0 million in PE 64366N to develop an improved data link for the Standard Missile family.

Airborne mine countermeasures

The budget request included $50.5 million in PE 64373N for airborne mine countermeasures, but included no funding for the development of the surface Navy integrated undersea tactical technology (SNIUTT) simulator. Funds for this program would allow the addition of a scenario-based simulation refresher training capability for postmission analysis for airborne mine countermeasure sonars. This simulator would utilize recorded sonar data to provide interactive training to sonar operators in recognizing and classifying sonar contacts. The committee recommends an increase of $3.0 million in PE 64373N for development of the SNIUTT simulator.

Submarine system development

The budget request included $75.4 million in PE 64503N, for submarine systems development, including $25.6 million for various submarine integrated antenna systems developments. The budget request did not include funding for the Small Business Innovative Research (SBIR) phase III project for an advanced processor build.

Submarines operate at a disadvantage in trying to fully participate in the Navy's efforts to implement network centric warfare. Submarines must have access to higher data rate communications than are currently available.

One near-term solution could involve using an expendable two-way satellite communications buoy operating in the ultra high frequency (UHF) portion of the electromagnetic spectrum. An approach that would employ fiber optic links between the submarine and a communications buoy could be compatible with existing buoy launcher systems. A longer-term approach would require extending communications capability to other portions of the electromagnetic spectrum. A tethered platform could provide such connectivity, and could be used to achieve better situational awareness by employing such sensor technologies as photonics, electronic support measures and acoustics. Such a tethered platform could also take advantage

of existing towed buoy handling mechanisms already installed on submarines. The committee recommends an increase of $4.0 million in PE 64503N, to pursue these developments.

The committee has confirmed with the Navy that the budget request of $10.0 million for the SBIR phase III project for the advanced processor build should be funded in PE 64503N, instead of PE 63582N. Therefore, the committee recommends an increase of $10.0 million in PE 64503N, for the advanced processor build.

The committee recommends a total authorization of $89.4 million in PE 64503N.

Shipboard aviation systems

The budget request included $28.6 million in PE 64512N for shipboard aviation systems, but included no funding for the development of an arresting cable made from synthetic material. The strength to weight ratio of synthetic materials is four to five times better than steel, resulting in reduced inertia and allowing the arresting gear to apply braking force much earlier in the landing. The committee recommends an increase of $2.5 million in PE 64512N for the development of synthetic arresting cable.

Virginia-class submarine development

The budget request included $143.3 million in PE 64558N for continuing development of the *Virginia*-class submarine. This includes the technology, prototype components, and systems engineering needed to design and construct the submarine and its command, control, communications and intelligence system. The budget request included no funding for information assurance. The committee recommends an increase of $2.0 million in PE 64558N for *Virginia*-class submarine information assurance.

The budget request included no funding to develop the multi-mission module concept for the *Virginia*-class submarine. The committee believes the flexibility that this concept brings to the platform is essential, and recommends an increase of $56.0 million in PE 64558N for the multi-mission module.

The budget request included no funding to develop a large aperture bow array for the *Virginia*-class submarine. This array has the potential to increase sonar system performance at a lower cost than the current spherical array. The committee recommends an increase of $5.0 million in PE 64558N for the development of a large aperture bow array.

The budget request included no funding for the common submarine radio room (CSRR). This effort was initiated as part of the *Virginia*-class submarine, and is now expected to be used across all submarine classes. The Chief of Naval Operations has included the CSSR on his Unfunded Priority List. The committee recommends an increase of $13.1 million in PE 64558N for the development of CSRR.

The committee recommends a total authorization of $219.4 million in PE 64558N.

Submarine tactical warfare systems

The budget request included $43.4 million in PE 64562N for submarine tactical warfare systems development. This program devel-

ops commercial off-the-shelf (COTS)-based software and hardware upgrades to integrate improved weapons and tactical control capabilities for all submarine classes. Among the goals of this development program is to provide fleet-wide improvements to submarine combat systems that reduce ownership costs, ease and enhance training, and ensure that the fleet has positive control over weapons and maintenance functions while underway.

The committee believes that the Navy should accelerate these efforts and expand them to include architecture upgrades and applications that would benefit the Navy and the fleet. The committee recommends an increase of $6.0 million in PE 64562N to establish a program to pursue these developments.

Anti-terrorism technology surveillance system

The budget request included $18.0 million in PE 64721N for the battle group passive horizon extension system, but included no funding for the anti-terrorism technology surveillance system (ATTSS). The ATTSS enhances the capability of the mobile inshore undersea warfare system upgrade, which provides surface and subsurface surveillance. The ATTSS provides low-cost detection and geolocation sensors, using commercial off-the-shelf technologies. The committee recommends an increase of $3.0 million in PE 64721N for ATTSS.

Directed energy user scrutiny equipment

The budget request included $48.2 million in PE 64755N for ship self-defense detection and control systems improvements. Of this amount, the Navy has requested $3.0 million for shipboard systems for conducting force protection operations.

The Air Force has been sponsoring an advanced concept technology demonstration (ACTD) program to employ millimeter wave electromagnetic energy as an active denial mechanism.

The committee believes that the Navy might be able to integrate such less-than-lethal directed energy technology in the integrated radar optical sighting and surveillance system (IROS3). Integrating such capability within the Navy systems could greatly increase options for Navy teams conducting the force protection mission.

Therefore, the committee recommends an increase of $5.0 million in PE 64755N to establish a program to begin packaging of the ACTD technology in IROS3 and evaluate whether such a system would be effective within the maritime environment.

NULKA anti-ship missile decoy development

The budget request included $28.2 million in PE 64757N for development of soft kill technologies for ship self-defense, but included no funding for continued improvement of the NULKA anti-ship missile decoy system. Anti-ship missile guidance systems are being developed which operate in new radio frequency bands or are employing multi-mode seekers, using infrared terminal guidance. The committee recommends an increase of $5.0 million in PE 64757N for development of improvements for the NULKA decoy.

Sea rescue technologies

The budget request included $6.9 million in PE 64771N for medical development. The committee recommends an increase in PE 64771N of $3.0 million for accelerated deployment of sea rescue equipment that automatically activates; is visible from the air; and decreases rescue times for injured personnel.

Joint strike fighter lift fan study

The budget request includes $2.2 billion in PE 64800N for the continuing development of the joint strike fighter (JSF). The JSF program has recently experienced setbacks in both cost and schedule for the system design and development phase, largely due to the fact that all three variants are currently projected to be over weight targets for this stage of the developmental effort. This weight problem is particularly critical for the short takeoff and vertical landing (STOVL) variant of the aircraft.

The committee is particularly concerned about one of the potential technical approaches under consideration to solve this problem. Increasing engine thrust could have detrimental effects in the area of reliability and engine life. To ensure this effort is adequately funded and the effects are fully understood, the committee recommends an increase of $15.0 million in PE 64800N for the investigation of increasing thrust on the JSF lift fan.

Navy management

The budget request included $66.1 million in PE 65861N for Navy science and technology management. The committee recommends a reduction in PE 65861N of $3.8 million due to unjustified program growth over the last three years.

Thin plate pure lead battery technology

The budget request included $108.8 million in PE 11221N for strategic submarine and weapons system support, but no funding for thin plate pure lead (TPPL) battery technology.

The committee is aware of ongoing research to apply well-understood TPPL technology to submarine batteries. This technology has the potential to increase submarine battery energy density; reduce corrosion and associated maintenance costs; and improve life span, performance, reliability, output, and recovery from deep discharges.

Therefore, the committee recommends an increase in PE 11221N of $5.0 million for research and development for thin plate pure lead battery technology.

Precision terrain aided navigation

The budget request included $28.8 million in PE 24229N for the Tomahawk weapons system, but included no funding for further development of precision terrain-aided navigation (PTAN). The PTAN offers an alternative guidance system to the Tomahawk cruise missile should Global Positioning System signals be lost through jamming. The committee recommends an increase of $5.0 million in PE 24229N for the continued development of PTAN.

Corrosion inhibiting coatings

The budget request included $62.6 million in PE 25633N for aviation improvements, but included no funding for the continued development of corrosion inhibiting coatings. Navy aircraft operate in a highly corrosive environment, and maintenance personnel have to devote many hours to corrosion control. The development of corrosion inhibiting coatings could increase aircraft availability, while easing the burden on maintenance personnel. The committee recommends an increase of $4.0 million in PE 25633N for the development of corrosion inhibiting coatings.

Battlefield management system

The budget request included $10.7 million in PE 26623M, for the development of combat service support equipment. The committee understands the Marine Corps is currently exploring ways to reduce operator and system interfaces in armored fighting vehicles by using: (1) integrated battle management information, (2) fire control information, (3) terrain and map information, and (4) platform sensor data into a single common operational picture. The committee understands the Marine Corps is supporting a proof-of-concept demonstration for this system. The committee recommends an increase of $2.0 million in PE 26623M for development of a battlefield management system, for a total authorization of $12.7 million.

Cobra Judy replacement

The budget request included $80.7 million in Research, Development, Test and Evaluation, Navy, for the Cobra Judy program. This level of funding sustains the important developmental effort associated with the Cobra Judy program to field a replacement platform in 2012, but does not fully restore funding to complete the development effort.

The Cobra Judy is a shipborne intelligence collection system that is an important part of the intelligence collection, treaty verification, and ballistic missile defense capabilities of the U.S. government. The unique capabilities of the Cobra Judy, combined with its ability to provide lengthy coverage of areas of interest, make it an indispensable part of the nation's overall intelligence collection capabilities.

The committee is concerned that complementary developmental activities in the Navy, the Missile Defense Agency, and the Intelligence Community are not being fully coordinated to ensure the development of a comprehensive measurement and signatures intelligence (MASINT) system that supports the intelligence needs of national decision makers; the missile warning requirements of ballistic missile defense systems; and, the operational needs of the Navy. Each of these organizations is developing capabilities for core requirements that also can provide support and reinforcing capabilities for the other. The committee urges the Secretary of Defense to review the radar developmental activities associated with the Cobra Judy, the Navy's DD(X) program, and ballistic missile defense to ensure the integration of complementary capabilities, the development of integrated operational procedures, and the elimination of unnecessary redundancy.

The committee recommends an increase of $13.0 million in PE 35149N, to restore the funding necessary to complete developmental activities associated with the Cobra Judy replacement program.

Modeling and simulation research

The budget request included $7.3 million in PE 38601N for modeling and simulation support. The committee recommends an increase in PE 38601N of $9.0 million for modeling and simulation research to ensure that the Joint Forces Command has access to state-of-the-art modeling, simulation, and wargaming capabilities for a wide range of scenarios, including urban warfare; integration with coalition forces; and simulations of weapons of mass destruction, including civilian support capabilities.

Air Force

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
			RESEARCH, DEVELOPMENT, TEST & EVALUATION, AIR FORCE			
3600	0601102F	1	DEFENSE RESEARCH SCIENCES	217,304	10,000	227,304
			Information assurance research		[3,000]	
			Logistics research		[2,000]	
			Advanced research in quantum information technology		[2,000]	
			Nanomaterials research		[3,000]	
3600	0601103F	2	UNIVERSITY RESEARCH INITIATIVES	115,865	16,600	132,465
			Photonics research		[1,600]	
			Nano- and micro-electromechanical research		[2,500]	
			Information security research		[2,500]	
			SMART Defense scholarship pilot program		[10,000]	
3600	0601108F	3	HIGH ENERGY LASER RESEARCH INITIATIVES	12,331		12,331
3600	0602102F	4	MATERIALS	73,660	3,400	77,060
			Composite materials research for unmanned structures		[1,500]	
			Blast resistant barriers		[1,900]	
3600	0602201F	5	AEROSPACE VEHICLE TECHNOLOGIES	74,679		74,679
3600	0602202F	6	HUMAN EFFECTIVENESS APPLIED RESEARCH	71,483	5,000	76,483
			Battlefield air operations technology		[5,000]	
3600	0602203F	7	AEROSPACE PROPULSION	92,650	10,000	102,650
			Hypersonics research (X-43C)		[10,000]	
3600	0602204F	8	AEROSPACE SENSORS	78,804	5,000	83,804
			Super-resolution Sensor System		[3,000]	
			Three-dimensional microelectronics development		[2,000]	

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
3600	0602500F	9	MULTI-DISCIPLINARY SPACE TECHNOLOGY	84,581		84,581
3600	0602601F	10	SPACE TECHNOLOGY	88,909	11,000	99,909
			Elastic memory composite research		[3,000]	
			Foldable space structures		[3,000]	
			Hyperspectral technology		[5,000]	
3600	0602602F	11	CONVENTIONAL MUNITIONS	52,251		52,251
3600	0602605F	12	DIRECTED ENERGY TECHNOLOGY	36,532		36,532
3600	0602702F	13	COMMAND CONTROL AND COMMUNICATIONS	82,147	1,000	83,147
			Joint battlespace infosphere		[1,000]	
3600	0602805F	14	DUAL USE SCIENCE AND TECHNOLOGY PROGRAM	5,151		5,151
3600	0602890F	15	HIGH ENERGY LASER RESEARCH	45,333		45,333
3600	0603112F	16	ADVANCED MATERIALS FOR WEAPON SYSTEMS	34,284	7,000	41,284
			Metals and aerospace alloys		[7,000]	
3600	0603203F	17	ADVANCED AEROSPACE SENSORS	30,634	4,000	34,634
			Advanced sensors		[4,000]	
3600	0603205F	18	FLIGHT VEHICLE TECHNOLOGY			
3600	0603211F	19	AEROSPACE TECHNOLOGY DEV/DEMO	29,145	2,000	31,145
			Photonics technology		[2,000]	
3600	0603216F	20	AEROSPACE PROPULSION AND POWER TECHNOLOGY	79,914	8,000	87,914
			Advanced turbine engine gas generators		[5,000]	
			Turbine engine program		[3,000]	
3600	0603231F	21	CREW SYSTEMS AND PERSONNEL PROTECTION TECHNOLOGY	32,794	-5,000	27,794
			Decision support cognitive systems		[-5,000]	
3600	0603270F	22	ELECTRONIC COMBAT TECHNOLOGY	28,282		28,282

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
3600	0603311F	23	BALLISTIC MISSILE TECHNOLOGY			
3600	0603333F	24	UNMANNED AIR VEHICLE DEV/DEMO			
3600	0603401F	25	ADVANCED SPACECRAFT TECHNOLOGY	60,124	27,000	87,124
			AC coupled interconnect		[5,000]	
			Hardening technologies for satellites		[7,000]	
			Thin film amorphous solar arrays		[7,000]	
			Boron energy cell technology		[5,000]	
			Intelligent free space optical satellite communications node		[3,000]	
3600	0603444F	26	MAUI SPACE SURVEILLANCE SYSTEM (MSSS)	6,306	10,000	16,306
			High accuracy network determination system		[10,000]	
3600	0603500F	27	MULTI-DISCIPLINARY ADVANCED DEVELOPMENT SPACE TECHNOLOGY	51,114	5,000	56,114
			Laser threat warning attack reporting for space		[5,000]	
3600	0603601F	28	CONVENTIONAL WEAPONS TECHNOLOGY	22,398	3,000	25,398
			Low Cost Autonomous Attack System		[3,000]	
3600	0603605F	29	ADVANCED WEAPONS TECHNOLOGY	31,103		31,103
3600	0603723F	30	ENVIRONMENTAL ENGINEERING TECHNOLOGY			
3600	0603789F	31	C3I ADVANCED DEVELOPMENT	28,524		28,524
3600	0603801F	32	SPECIAL PROGRAMS	320,503		320,503
3600	0603850F	33	INTEGRATED BROADCAST SERVICE	2,294		2,294
3600	0603924F	34	HIGH ENERGY LASER ADVANCED TECHNOLOGY PROGRAM	8,547		8,547
3600	0207423F	35	ADVANCED COMMUNICATIONS SYSTEMS	12,051		12,051
3600	0401840F	36	AMC COMMAND AND CONTROL SYSTEM	6,038		6,038
3600	0804757F	37	JOINT NATIONAL TRAINING CENTER	2,939		2,939
3600	0603260F	38	INTELLIGENCE ADVANCED DEVELOPMENT	4,612		4,612

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
3600	0603287F	39	PHYSICAL SECURITY EQUIPMENT	22,640		22,640
3600	0603421F	40	NAVSTAR GLOBAL POSITIONING SYSTEM III	40,568		40,568
3600	0603430F	41	ADVANCED EHF MILSATCOM (SPACE)	612,049		612,049
3600	0603432F	42	POLAR MILSATCOM (SPACE)	960		960
3600	0603434F	43	NATIONAL POLAR-ORBITING OPERATIONAL ENVIRONMENTAL SATELLITE			
3600	0603438F	44	SPACE CONTROL TECHNOLOGY	15,046		15,046
3600	0603742F	45	COMBAT IDENTIFICATION TECHNOLOGY	19,582		19,582
3600	0603790F	46	NATO RESEARCH AND DEVELOPMENT	3,930		3,930
3600	0603791F	47	INTERNATIONAL SPACE COOPERATIVE R&D	552		552
3600	0603845F	48	TRANSFORMATIONAL SATCOM (TSAT)	774,836	-100,000	674,836
			TSAT program risk		[-100,000]	
3600	0603850F	49	INTEGRATED BROADCAST SERVICE	23,927		23,927
3600	0603851F	50	INTERCONTINENTAL BALLISTIC MISSILE	72,503		72,503
3600	0603854F	51	WIDEBAND GAPFILLER SYSTEM RDT&E (SPACE)	73,499		73,499
3600	0603856F	52	AIR FORCE/NATIONAL PROGRAM COOPERATION (AFNPC)			
3600	0603858F	53	SPACE-BASED RADAR	327,732		327,732
3600	0603859F	54	POLLUTION PREVENTION	2,692		2,692
3600	0603860F	55	JOINT PRECISION APPROACH AND LANDING SYSTEMS	18,385		18,385
3600	0604015F	56	NEXT GENERATION BOMBER			
3600	0604327F	57	HARD AND DEEPLY BURIED TARGET DEFEAT SYSTEM (HDBTDS) PROGRAM	6,383		6,383
3600	0604731F	58	UNMANNED COMBAT AIR VEHICLE (UCAV)			
3600	0604855F	59	OPERATIONALLY RESPONSIVE LAUNCH	35,362	7,500	42,862
			Operationally responsive launch		[7,500]	
3600	0604856F	60	COMMON AERO VEHICLE (CAV)	21,610		21,610

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
3600	0305178F	61	NATIONAL POLAR-ORBITING OPERATIONAL ENVIRONMENTAL SATELLITE	307,668		307,668
3601	0603840F	62	GLOBAL BROADCAST SERVICE (GBS)	33,447		33,447
3600	0604012F	63	JOINT HELMET MOUNTED CUEING SYSTEM (JHMCS)	2,867		2,867
3600	0604222F	64	NUCLEAR WEAPONS SUPPORT	13,301		13,301
3600	0604226F	65	B-1B	59,462	20,000	79,462
			B-1 data link and FLIR upgrades		[20,000]	
3600	0604233F	66	SPECIALIZED UNDERGRADUATE FLIGHT TRAINING	3,359		3,359
3600	0604239F	67	F-22	210,000		210,000
3600	0604240F	68	B-2 ADVANCED TECHNOLOGY BOMBER	245,049		245,049
3600	0604270F	69	ELECTRONIC WARFARE DEVELOPMENT	138,393	14,700	153,093
			PLAID		[14,700]	
3600	0604280F	70	JOINT TACTICAL RADIO	49,856		49,856
3600	0604287F	71	PHYSICAL SECURITY EQUIPMENT	9,744		9,744
3600	0604329F	72	SMALL DIAMETER BOMB (SDB)	76,489		76,489
3600	0604421F	73	COUNTERSPACE SYSTEMS	75,863	5,000	80,863
			Space control test capabilities		[5,000]	
3600	0604435F	74	ADVANCED POLAR MILSATCOM			
3600	0604441F	75	SPACE BASED INFRARED SYSTEM (SBIRS) HIGH EMD	508,448	35,000	543,448
			SBIRS development		[35,000]	
3600	0604479F	76	MILSTAR LDR/MDR SATELLITE COMMUNICATIONS (SPACE)	1,380		1,380
3600	0604600F	77	MUNITIONS DISPENSER DEVELOPMENT	28,048		28,048
3600	0604602F	78	ARMAMENT/ORDNANCE DEVELOPMENT	8,353		8,353
3600	0604604F	79	SUBMUNITIONS	4,824		4,824
3600	0604617F	80	AGILE COMBAT SUPPORT	10,053		10,053

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
3600	0604618F	81	JOINT DIRECT ATTACK MUNITION			
3600	0604706F	82	LIFE SUPPORT SYSTEMS	6,630		6,630
3600	0604731F	83	UNMANNED COMBAT AIR VEHICLE (UCAV)			
3600	0604735F	84	COMBAT TRAINING RANGES	18,714		18,714
3600	0604740F	85	INTEGRATED COMMAND & CONTROL APPLICATIONS (IC2A)	258		258
3600	0604750F	86	INTELLIGENCE EQUIPMENT	1,349		1,349
3600	0604754F	87	TACTICAL DATA LINK INFRASTRUCTURE			
3600	0604762F	88	COMMON LOW OBSERVABLES VERIFICATION SYSTEM (CLOVERS)	10,303		10,303
3600	0604800F	89	JOINT STRIKE FIGHTER (JSF)	2,307,420		2,307,420
3600	0604851F	90	INTERCONTINENTAL BALLISTIC MISSILE	91,687		91,687
3600	0604853F	91	EVOLVED EXPENDABLE LAUNCH VEHICLE PROGRAM (SPACE)	27,000		27,000
3600	0605011F	92	RDT&E FOR AGING AIRCRAFT	15,665		15,665
3600	0207131F	93	A-10 SQUADRONS			
3600	0207256F	94	UNMANNED COMBAT AIR VEHICLE JOINT PROGRAM OFFICE	2,911		2,911
3600	0207434F	95	LINK-16 SUPPORT AND SUSTAINMENT	141,012		141,012
3600	0207443F	96	FAMILY OF INTEROPERABLE OPERATIONAL PICTURES (FIOP)	44,947		44,947
3600	0207450F	97	MULTI-SENSOR C2 AIRCRAFT (MC2A)	538,860	-40,000	498,860
			Reduction - MC2A (late delivery of test bed aircraft)		[-40,000]	
3600	0207701F	98	FULL COMBAT MISSION TRAINING	5,894		5,894
3600	0305176F	99	COMBAT SURVIVOR EVADER LOCATOR			
3600	0401318F	100	CV-22	16,439		16,439
3600	0604256F	101	THREAT SIMULATOR DEVELOPMENT	34,517		34,517
3600	0604759F	102	MAJOR T&E INVESTMENT	58,933		58,933
3600	0605101F	103	RAND PROJECT AIR FORCE	24,970		24,970

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
3600	0605306F	104	RANCH HAND II EPIDEMIOLOGY STUDY	4,813		4,813
3600	0605502F	105	SMALL BUSINESS INNOVATION RESEARCH			
3600	0605712F	106	INITIAL OPERATIONAL TEST & EVALUATION	28,839		28,839
3600	0605807F	107	TEST AND EVALUATION SUPPORT	356,266		356,266
3600	0605860F	108	ROCKET SYSTEMS LAUNCH PROGRAM (SPACE)	7,984	22,500	30,484
			Ballistic missile range safety technology		[15,000]	
			Microsatellite launch capability		[7,500]	
3600	0605864F	109	SPACE TEST PROGRAM (STP)	44,521		44,521
3600	0605976F	110	FACILITIES RESTORATION AND MODERNIZATION - TEST AND EVALUATION	58,936		58,936
3600	0605978F	111	FACILITIES SUSTAINMENT - TEST AND EVALUATION SUPPORT	23,067		23,067
3600	0804731F	112	GENERAL SKILL TRAINING	323		323
3600	0909900F	113	FINANCING FOR EXPIRED ACCOUNT ADJUSTMENTS			
3600	0909980F	114	JUDGMENT FUND REIMBURSEMENT	100,000		100,000
3600	1001004F	115	INTERNATIONAL ACTIVITIES	3,945		3,945
3600	0605024F	116	ANTI-TAMPER TECHNOLOGY EXECUTIVE AGENCY	7,858		7,858
3600	0101113F	117	B-52 SQUADRONS	25,766		25,766
3600	0101120F	118	ADVANCED CRUISE MISSILE	7,740		7,740
3600	0101122F	119	AIR-LAUNCHED CRUISE MISSILE (ALCM)	11,837		11,837
3600	0101313F	120	STRAT WAR PLANNING SYSTEM - USSTRATCOM	23,391		23,391
3600	0101314F	121	NIGHT FIST - USSTRATCOM	4,987		4,987
3600	0101815F	122	ADVANCED STRATEGIC PROGRAMS	8,393		8,393
3600	0102326F	123	REGION/SECTOR OPERATION CONTROL CENTER MODERNIZATION PROGRA	19,047		19,047
3600	0203761F	124	WARFIGHTER RAPID ACQUISITION PROCESS (WRAP) RAPID TRANSITION FU	24,935		24,935
3600	0207028F	125	JOINT EXPEDITIONARY FORCE EXPERIMENT			

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
3600	0207131F	126	A-10 SQUADRONS	22,590	10,000	32,590
			A-10 propulsion modernization		[10,000]	
3600	0207133F	127	F-16 SQUADRONS	99,606		99,606
3600	0207134F	128	F-15E SQUADRONS	115,246	17,200	132,446
			F-15C/D radar block upgrade		[17,200]	
3600	0207136F	129	MANNED DESTRUCTIVE SUPPRESSION	16,976		16,976
3600	0207138F	130	F/A-22 SQUADRONS	354,528		354,528
3600	0207141F	131	F-117A SQUADRONS	29,661		29,661
3600	0207161F	132	TACTICAL AIM MISSILES	5,558		5,558
3600	0207163F	133	ADVANCED MEDIUM RANGE AIR-TO-AIR MISSILE (AMRAAM)	33,266		33,266
3600	0207224F	134	COMBAT RESCUE AND RECOVERY	12,342		12,342
3600	0207247F	135	AF TENCAP	10,673	5,000	15,673
			GPS jammer detection and locator system		[5,000]	
3600	0207248F	136	SPECIAL EVALUATION PROGRAM	199,040		199,040
3600	0207253F	137	COMPASS CALL	3,990		3,990
3600	0207268F	138	AIRCRAFT ENGINE COMPONENT IMPROVEMENT PROGRAM	165,609		165,609
3600	0207277F	139	CSAF INNOVATION PROGRAM	1,879		1,879
3600	0207325F	140	JOINT AIR-TO-SURFACE STANDOFF MISSILE (JASSM)	45,777		45,777
3600	0207410F	141	AIR & SPACE OPERATIONS CENTER (AOC)	27,695		27,695
3600	0207412F	142	CONTROL AND REPORTING CENTER (CRC)	11,634		11,634
3600	0207417F	143	AIRBORNE WARNING AND CONTROL SYSTEM (AWACS)	288,787		288,787
3600	0207423F	144	ADVANCED COMMUNICATIONS SYSTEMS	20,066		20,066
3600	0207424F	145	EVALUATION AND ANALYSIS PROGRAM			
3600	0207433F	146	ADVANCED PROGRAM TECHNOLOGY	249,391		249,391

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
3600	0207438F	147	THEATER BATTLE MANAGEMENT (TBM) C4I	37,210		37,210
3600	0207445F	148	FIGHTER TACTICAL DATA LINK	50,976		50,976
3600	0207446F	149	BOMBER TACTICAL DATA LINK	120,256		120,256
3600	0207448F	150	C2ISR TACTICAL DATA LINK	25,441		25,441
3600	0207449F	151	COMMAND AND CONTROL (C2) CONSTELLATION	44,035		44,035
3600	0207581F	152	JOINT SURVEILLANCE/TARGET ATTACK RADAR SYSTEM (JSTARS)	89,247		89,247
3600	0207590F	153	SEEK EAGLE	23,159		23,159
3600	0207591F	154	ADVANCED PROGRAM EVALUATION	474,734		474,734
3600	0207601F	155	USAF MODELING AND SIMULATION	18,693		18,693
3600	0207605F	156	WARGAMING AND SIMULATION CENTERS	6,377		6,377
3600	0208006F	157	MISSION PLANNING SYSTEMS	136,701		136,701
3600	0208021F	158	INFORMATION WARFARE SUPPORT	7,230		7,230
3600	0208160F	159	TECHNICAL EVALUATION SYSTEM			
3600	0208161F	160	SPECIAL EVALUATION SYSTEM			
3600	0301310F	161	NATIONAL AIR INTELLIGENCE CENTER	[ ]		
3600	0301314F	162	COBRA BALL	[ ]		
3600	0301315F	163	MISSILE AND SPACE TECHNICAL COLLECTION	[ ]		
3600	0301324F	164	FOREST GREEN	[ ]		
3600	0301398F	165	MANAGEMENT HEADQUARTERS GDIP	[ ]		
3600	0302015F	166	E-4B NATIONAL AIRBORNE OPERATIONS CENTER (NAOC)	11,172		11,172
3600	0303110F	167	DEFENSE SATELLITE COMMUNICATIONS SYSTEM (SPACE)			
3600	0303131F	168	MINIMUM ESSENTIAL EMERGENCY COMMUNICATIONS NETWORK (MEECN	33,183		33,183

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
3600	0303140F	169	INFORMATION SYSTEMS SECURITY PROGRAM	79,625	8,000	87,625
			Cyber security research		[5,000]	
			Info systems security research		[3,000]	
3600	0303141F	170	GLOBAL COMBAT SUPPORT SYSTEM	18,637		18,637
3600	0303150F	171	GLOBAL COMMAND AND CONTROL SYSTEM	3,611	8,000	11,611
			Global awareness presentation system		[8,000]	
3600	0303401F	172	COMMUNICATIONS SECURITY (COMSEC)			
3600	0303601F	173	MILSATCOM TERMINALS	272,149		272,149
3600	0304111F	174	SPECIAL ACTIVITIES	[ ]		
3600	0304311F	175	SELECTED ACTIVITIES	[ ]		
3600	0305099F	176	GLOBAL AIR TRAFFIC MANAGEMENT (GATM)	7,291		7,291
3600	0305110F	177	SATELLITE CONTROL NETWORK (SPACE)	17,833	3,000	20,833
			Civil reserve space service		[3,000]	
3600	0305111F	178	WEATHER SERVICE	16,526		16,526
3600	0305114F	179	AIR TRAFFIC CONTROL, APPROACH, AND LANDING SYSTEM (ATCALS)	7,371		7,371
3600	0305116F	180	AERIAL TARGETS	5,178		5,178
3600	0305128F	181	SECURITY AND INVESTIGATIVE ACTIVITIES	484		484
3600	0305142F	182	APPLIED TECHNOLOGY AND INTEGRATION	[ ]		
3600	0305148F	183	AIR FORCE TACTICAL MEASUREMENT AND SIGNATURE INTELLIGENCE (M/	7,905		7,905
3600	0305159F	184	DEFENSE RECONNAISSANCE SUPPORT ACTIVITIES (SPACE)	219,345		219,345
3600	0305160F	185	DEFENSE METEOROLOGICAL SATELLITE PROGRAM (SPACE)			
3600	0305164F	186	NAVSTAR GLOBAL POSITIONING SYSTEM (USER EQUIPMENT) (SPACE)	104,114		104,114
3600	0305165F	187	NAVSTAR GLOBAL POSITIONING SYSTEM (SPACE AND CONTROL SEGMENT	148,344		148,344
3600	0305172F	188	COMBINED ADVANCED APPLICATIONS	[ ]		

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
3600	0305174F	189	SPACE WARFARE CENTER	411		411
3600	0305182F	190	SPACELIFT RANGE SYSTEM (SPACE)	47,253		47,253
3600	0305191F	191	PERSONNEL SECURITY INVESTIGATIONS PROGRAM - AIR FORCE	118,787		118,787
3600	0305193F	192	INTELLIGENCE SUPPORT TO INFORMATION OPERATIONS (IO)	1,097		1,097
3600	0305202F	193	DRAGON U-2 (JMIP)	87,745		87,745
3600	0305205F	194	ENDURANCE UNMANNED AERIAL VEHICLES			
3600	0305206F	195	AIRBORNE RECONNAISSANCE SYSTEMS	55,464		55,464
3600	0305207F	196	MANNED RECONNAISSANCE SYSTEMS	13,283		13,283
3600	0305208F	197	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS	21,232		21,232
3600	0305219F	198	PREDATOR UAV (JMIP)	81,346		81,346
3600	0305220F	199	GLOBAL HAWK UAV (JMIP)	336,159		336,159
3600	0305887F	200	INTELLIGENCE SUPPORT TO INFORMATION WARFARE	963		963
3600	0305906F	201	NCMC - TW/AA SYSTEM	64,822		64,822
3600	0305910F	202	SPACETRACK (SPACE)	161,838	10,700	172,538
			Air Force Space Surveillance System		[10,700]	
3600	0305911F	203	DEFENSE SUPPORT PROGRAM (SPACE)			
3600	0305913F	204	NUDET DETECTION SYSTEM (SPACE)	35,398		35,398
3600	0305917F	205	SPACE ARCHITECT	12,907		12,907
3600	0308601F	206	MODELING AND SIMULATION SUPPORT			
3600	0308699F	207	SHARED EARLY WARNING (SEW)	3,345		3,345
3600	0401115F	208	C-130 AIRLIFT SQUADRON	150,242		150,242
3600	0401119F	209	C-5 AIRLIFT SQUADRONS (IF)	332,982		332,982
3600	0401130F	210	C-17 AIRCRAFT (IF)	199,692		199,692
3600	0401132F	211	C-130J PROGRAM	36,305		36,305

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
3600	0401134F	212	LARGE AIRCRAFT IR COUNTERMEASURES (LAIRCM)	73,684		73,684
3600	0401218F	213	KC-135S	1,079		1,079
3600	0401219F	214	KC-10S	18,452		18,452
3600	0408011F	215	SPECIAL TACTICS / COMBAT CONTROL	1,067		1,067
3600	0702207F	216	DEPOT MAINTENANCE (NON-IF)	1,431		1,431
3600	0702806F	217	ACQUISITION AND MANAGEMENT SUPPORT	1,596		1,596
3600	0708011F	218	INDUSTRIAL PREPAREDNESS	38,012	4,500	42,512
			Aircraft batteries		[2,000]	
			Advanced nanomaterials research		[2,500]	
3600	0708012F	219	LOGISTICS SUPPORT ACTIVITIES			
3600	0708026F	220	PRODUCTIVITY, RELIABILITY, AVAILABILITY, MAINTAIN. PROG OFC (PRAM			
3600	0708611F	221	SUPPORT SYSTEMS DEVELOPMENT	50,238	7,000	57,238
			Modular fuel cell architecture development		[5,000]	
			Unmanned aging aircraft maintenance		[2,000]	
3600	0708612F	222	COMPUTER RESOURCES SUPPORT IMPROVEMENT PROGRAM (CRSIP)			
3600	0808716F	223	OTHER PERSONNEL ACTIVITIES	110		110
3600	0901212F	224	SERVICE-WIDE SUPPORT (NOT OTHERWISE ACCOUNTED FOR)			
3600	0901218F	225	CIVILIAN COMPENSATION PROGRAM	7,272		7,272
3600	0901538F	226	FINANCIAL MANAGEMENT INFORMATION SYSTEMS DEVELOPMENT	15,732		15,732
3600	XXXXXXXXX	999	CLASSIFIED PROGRAMS	5,551,279		5,551,279
			Financial information systems		-11,500	-11,500
			Total, RDT&E Air Force	**21,114,667**	**149,600**	**21,264,267**

Air Force basic research

The budget request included $217.3 million in PE 61102F for defense research sciences. The committee recommends an increase in PE 61102F of $10.0 million to accelerate pursuit of basic Air Force research in information assurance, logistics, and materials. Of this amount, the committee recommends an increase of: $3.0 million for information assurance research; $2.0 million for logistics research to improve design, deployability, performance, and support of current and future weapons systems; $2.0 million for quantum information technology; and $3.0 million for nanomaterials research.

Air Force university research

The budget request included $115.9 million in PE 61103F for the Air Force University Research Initiatives program. Basic research performed by universities in support of Air Force missions continues to play a key role in addressing persistent and emerging needs in areas such as information and network security and education of future experts in the exploitation of defense-related multidisciplinary technologies. The committee recommends an increase in PE 61103F of $16.6 million: $2.5 million for information security research; $1.6 million for photonics research; $2.5 million for nano- and micro-electromechanical research to explore and exploit the growing strength of nanotechnology and interfaces for sensor, controller and guidance systems; and $10.0 million to support the Science, Mathematics And Research for Transformation (SMART) Defense Scholarship Program.

Air Force materials

The budget request included $73.7 million in PE 62102F for materials research. The committee recognizes the continued importance of unmanned vehicles in today's battlefield, and the need for timely, cost-effective production of these systems. Unmanned vehicles require unique structures and materials. The committee recommends an increase in PE 62102F of $1.5 million for composite research for manned and unmanned flight structures.

Another area of critical materials research involves new approaches to address the threat posed by conventional explosives. Currently, a wide variety of commercial and makeshift barricades are in use by the military to secure infrastructure and bases inside the U.S. and those on deployment. These barriers provide limited capability to stop large vehicles and are not designed to withstand a blast. The committee recommends an increase in PE 62102F of $1.9 million for research on blast resistant barriers that would stop large vehicles, withstand explosions, protect infrastructure, and reduce injuries resulting from an attack.

Battlefield air operations technology

The budget request included $71.5 million in PE 62202F Human Effectiveness Applied Research. The committee recommends an increase in PE 62202F of $5.0 million for Air Force unfunded requirements in the area of battlefield air operations. Research would focus on developing and assessing technologies and designs for effective information display, human-centered information operations, and experiments regarding crew station layouts and func-

tional integration, with the aim of improving command center efficiency.

Hypersonics research

The budget request included $92.7 million in PE 62203F for aerospace propulsion. The committee recommends that the Department of Defense continue the long-term aircraft and space access component of hypersonics engine research that was pursued in partnership with the National Aeronautics and Space Administration (NASA). The committee understands the Air Force need for a focus on immediate applications of hypersonics engine research, but believes missile applications are achievable in the nearer-term, without suspending work on longer-term aircraft and space access goals. The committee recommends an increase in PE 62203F of $10.0 million specifically for continuation of the X–43C demonstrator. The Air Force partnership with NASA would develop and demonstrate new engine technologies and vehicles, capable of operating over a broad range of flight Mach numbers, to enable future high-speed and hypersonic weapons and aircraft. The committee believes that the future years X–43C, X–43B, and Falcon programs each have the potential to demonstrate significant capabilities required by hypersonic aircraft and space access systems. In addition, pursuit of the X–43C serves dual purposes; as a missile demonstrator and for aircraft applications that require a multiengine platform. The committee believes that the Air Force should renew the X–43C partnership with NASA, since both agencies have important long-term missions in space access that require hypersonic aircraft.

Aerospace sensors

The budget request included $78.8 million in PE 62204F for aerospace sensors. In order to assure reliable communications in the battlefield, the thermal and electrical performance of circuit packaging modules must match the performance of the radio frequency integrated circuits. The committee recommends an increase in PE 62204F of $2.0 million for a three-dimensional microelectronics packaging approach for integrated circuits that lowers their size and weight and improves the electrical and thermal performance of packaged modules especially for radio frequency communication applications. In the area of advanced sensor research, the committee recommends an increase of $3.0 million for super resolution sensors, which have the potential to result in new tactical surveillance and strike capabilities and could enhance the Air Force's ability to conduct command, control, intelligence, surveillance, and reconnaissance missions.

Space technology

The budget request included $88.9 million in PE 62601F for space technology. Advances in deployable boom architectures and the mechanisms that enable them to be autonomously erected in space have resulted in advances in the performance of lightweight deployable structures for spacecraft. New boom systems increase the capabilities and lower the mass of information gathering, antenna, sun shield and solar power systems. Technological advances

must be made to dramatically increase the capabilities of U.S. radar, reconnaissance, and communications spacecraft. Therefore, the committee recommends an increase in PE 62601F of $3.0 million for elastic memory composite materials; $3.0 million for foldable articulated structures for next generation spacecraft; and $5.0 million for hyperspectral technology.

Air Force command, control, and communications

The budget request included $82.1 million in PE 62702F for command, control, and communications. The committee recommends an increase in PE 62702F of $1.0 million for the joint battlefield infosphere research program for additional development of computer and software technologies to distribute mission critical information to warfighters globally.

Advanced materials for weapons systems

The budget request included $34.3 million in PE 63112F for advanced materials for weapons systems. The committee recommends an increase in PE 63112F of $7.0 million for research on affordable metals and aerospace alloys. The committee notes that advances in these materials technologies and in the manufacturing processes used to produce them are critical to support future Air Force needs.

Advanced aerospace sensors

The budget request included $30.6 million in PE 63203F for advanced aerospace sensors. The present need of special operations units for systems to detect, identify, and neutralize a threat, as well as detect and display the battlespace is critical for operators in urban environments. The committee recommends an increase in PE 63203F of $4.0 million for remote sensing and building architecture reconstruction programs, which provide the warfighter with real time building layout displays, and assist in urban reconnaissance, surveillance, and target acquisition.

Aerospace technologies and demonstrations

The budget request included $29.1 million in PE 63211F for aerospace technology development and demonstration. Electro-magnetic interference is a significant problem for aircraft systems. Protection methods currently in use involve extensive shielding, which adds weight, increases costs, and decreases performance. The committee recommends an increase in PE 63211F of $2.0 million for the demonstration of photonic technology to address these challenges.

Turbine engine program

The budget request included $79.9 million in PE 63216F for aerospace propulsion and power technology. The committee recommends an increase in PE 63216F of $5.0 million for the integrated advanced turbine engine gas generator and $3.0 million for Air Force unfunded priority research on the versatile, affordable, advanced turbine engine program to accelerate progress on improved fuel systems for high-speed and hypersonic flight.

Cognitive systems

The budget request included $32.8 million in PE 63231F for crew systems and personnel protection technology. Decision support and cognitive research projects are under exploration by several services and Department of Defense agencies. The committee recommends a reduction in PE 63231F of $5.0 million and urges coordination with other similar projects and activities.

Advanced solar arrays

The budget request included $60.1 million in PE 63401F for advanced spacecraft technology, of which $2.2 million is for development and evaluation of space conventional power generation technologies, such as advanced thin film solar cells.

The committee is aware of ongoing research on high specific power thin film multi-junction amorphous silicon arrays on flexible substrates for space applications. Such technology has the potential to produce solar arrays that are five times greater in specific power, five to ten times cheaper, three to five times lighter, require five times less stowed volume, and offer improved radiation resistance compared to current solar arrays.

In light of the promise of this technology, the committee believes that the requested funding is insufficient. The committee recommends an increase of $7.0 million in PE 63401F for continued development of thin film multi-junction amorphous silicon arrays on flexible substrates for space applications.

Advanced spacecraft technology

The budget request included $60.1 million in PE 63401F for advanced spacecraft technology, but no funding for research on alternating current coupled interconnect (ACCI) technology.

The committee appreciates the importance of high processing rates on spacecraft to meet mission requirements. The committee is aware of ongoing research and development on ACCI technology, which is intended to achieve high-density, high-reliability electrical interconnects between computer chips, enabling such chips to exchange data at much higher rates than is currently possible. This technology shows promise for improving both performance and packaging of advanced chips.

The committee recommends an increase of $5.0 million in PE 63401F for continued research on ACCI technology.

Boron energy cell technology

The budget request included $60.1 million in PE 63401F for advanced spacecraft technology, but no funding for boron energy cell technology.

The committee recognizes the importance of reliable and efficient power supplies for satellites, and is aware of ongoing research and development on boron energy cells that convert radioisotope emissions into electric power. Because these cells would be scalable and could be produced in various shapes and sizes, the committee believes that this technology has the promise to reduce the need for central power distribution systems and streamline satellite power system design and assembly.

The committee recommends an increase of $5.0 million in PE 63401F for boron energy cell technology.

Intelligent free space optical satellite communications node

The budget request included $60.1 million in PE 63401F for advanced spacecraft technology, but no funding for research and development on intelligent free space optical satellite communications nodes.

The committee notes that the Department of Defense is pursuing a number of acquisition efforts to meet growing demand for communications bandwidth. The committee is aware of ongoing research and development on intelligent and adaptive communications networks enabled by fiber optic transceivers and high speed multichannel free space laser communications transceivers. The committee believes that these technologies can help reduce the development risk for the transformational military satellite (TSAT) communications program by enhancing both radio frequency and laser communications and providing low-cost adaptive switching, and that additional funding is needed for development and space qualification.

The committee recommends an increase of $3.0 million in PE 63401F for research and development for intelligent free space optical satellite communications nodes.

Satellite protection technology

The budget request included $60.1 million in PE 63401F for advanced spacecraft technology, but no funding for hardening technologies for satellite protection (HTSP).

The committee remains concerned about the potential vulnerability of U.S. military and commercial satellites, particularly in light of the increasing reliance of the military on space assets and foreign efforts to develop the means to disrupt U.S. exploitation of those assets.

An effort to develop an integrated module to the standard Satellite Tool Kit for low-cost laser and radio frequency hardening techniques was initiated in fiscal year 2001. The committee believes that providing low-cost, standardized tools to satellite designers will allow measures to reduce vulnerability to be designed into satellites, rather than added on, thus minimizing cost and design changes.

The committee recommends an increase of $7.0 million in PE 63401F to continue research and development on hardening technologies for satellite protection.

High accuracy network determination system

The budget request included $6.3 million in PE 63444F for the Maui Space Surveillance program, but no funding for the high accuracy network determination system (HANDS).

HANDS is intended to develop a network of relatively low resolution optical sensor systems linked through a central high performance computing system to improve space situational awareness. The committee believes that improved space situational awareness will be important in reducing the vulnerability of U.S. space assets, and understands that additional funds for the HANDS project

could be used to operate the network, design and build upgraded optical sensors, and tie the sensors to the high performance computing system.

The committee recommends an increase of $10.0 million in PE 63444F to continue HANDS research and development.

Laser threat warning attack reporting

The budget request included $51.1 million in PE 63500F for multidisciplinary advanced development space technology, of which $1.1 million is for the development of laser warning sensor technology.

The committee recognizes that U.S. space systems are potentially vulnerable to ground-based directed energy threats. The laser threat warning attack reporting program is intended to develop electro-optical sensors capable of detecting and characterizing laser radiation incident on space systems.

The committee recommends an increase of $5.0 million in PE 63500F for the laser threat warning reporting development effort, to accelerate the development of electro-optical threat warning and attack reporting sensors.

Low cost autonomous attack system

The budget request included $22.4 million in PE 63601F for conventional weapon technology, including $7.0 million for technology related to the demonstration of the low cost autonomous attack system (LOCAAS). The objective of the LOCAAS program is to demonstrate an affordable, miniature, autonomous powered munition capable of searching, detecting, identifying, tracking, and destroying a broad-spectrum of fixed and mobile ground targets. The committee recommends an increase of $3.0 million in PE 63601F for the continued development of LOCAAS.

Transformational military satellite communications

The budget request included $774.8 million in PE 63845F for the transformational military satellite (TSAT) communications program.

The committee recognizes the increasing importance of communications to net-centric military operations, and remains committed to the development of systems that will provide substantial increases in bandwidth available to warfighters and the intelligence community. The TSAT effort is intended to develop a new communications architecture based on laser crosslinks, internet protocol packet switching, new security protocols, new ground terminals, and integration with a new ground communications network. TSAT is intended to provide bandwidth orders of magnitude greater than is available today. The first TSAT launch is now projected for fiscal year 2012.

The committee remains supportive of the TSAT effort, but concerned that the technical risks in the program are very high. The committee notes that the request is more than double the amount authorized and appropriated for this program in fiscal year 2004. The committee recommends a decrease of $100.0 million in PE 63845F. The committee believes that the remaining amount authorized will allow the program to proceed vigorously with risk re-

duction activities, and that more moderate pacing of the program will ultimately lower risk and allow for more timely deployment.

Operationally responsive launch

The budget request included $35.4 million in PE 64855F for research and development of operationally responsive launch capabilities.

The committee believes that the development low-cost launch capabilities is critical to future U.S. military space capabilities. The committee notes that the two families of evolved expendable launch vehicles developed in the late 1990s were intended to reduce the cost of launch by 25–50 percent compared to legacy launch systems. This projection was based to a substantial degree on projections of a very large commercial launch market, which would allow the military to amortize launch infrastructure costs over a large number of launches. This commercial market never materialized, and consequently, military space launch remains extraordinarily expensive. The committee continues to believe that redundancy is key to assured access to space, but is concerned that the current structure of the launch industry may not be sustainable in the long term.

The committee notes that the operationally responsive launch program will develop near-term low-cost launch alternatives, but that the first test launch is not scheduled until fiscal year 2007 and only four test launches are scheduled through fiscal year 2009. The committee believes that additional funding could support an acceleration of the development and test schedule.

The committee recommends an increase of $7.5 million in PE 64855F to accelerate the operationally responsive launch program.

B–1 bomber

The budget request included $59.5 million in PE 64226F for upgrades to the B–1B bomber, of which $22.0 million is for research and development of a fully integrated data link (FIDL).

The committee notes that the B–1B bomber was used extensively in operations in Afghanistan and Iraq. The committee also notes that a FIDL will enhance the accuracy, tactical flexibility, and mission effectiveness of the B–1B, but that development and procurement of the FIDL is not scheduled to be completed until 2014. The committee is also aware that the Air Combat Command roadmap for B–1B upgrades includes a forward- looking infrared sensor toward the end of the decade that will provide improved target detection and targeting capability. The committee believes that additional funds to accelerate these upgrade efforts are justified.

The committee recommends an increase of $20.0 million in PE 64226F for research and development of the FIDL and forward-looking infrared systems.

Electronic warfare development

The budget request included $138.4 million in PE 64270F for electronic warfare development, including $18.0 million for the continued development of the precision location and identification (PLAID) upgrade to the ALR–69 radar warning receiver (RWR). This upgrade allows the RWR to precisely detect threats, at greater range and with greater accuracy than the existing AN/ALR–69.

The committee recommends an increase of $14.7 million in PE 64270F for the continued development of AN/ALR–69 PLAID.

Space control test capabilities

The budget request included $75.9 million in PE 64421F for Air Force counterspace systems.

U.S. national security space policy includes a requirement to develop, operate, and maintain space control capabilities to ensure freedom of action in space and to deny freedom of action in space to adversaries. The committee recognizes that further development of ground-based space control technologies, which take advantage of ongoing Army efforts, could contribute significant near-term capabilities to selectively negate adversary space-based assets.

The committee recommends an increase of $5.0 million in PE 64421F for continued test and development of command and control capabilities for ground-based space control assets. The committee notes that U.S. space control efforts have focused on denying adversary access to space-based assets through reversible effects, and directs that these additional funds be applied consistent with that focus.

Space-based infrared system

The budget request included $508.4 million in PE 64441F for development of the space-based infrared system (SBIRS).

When deployed, SBIRS will provide improved early-warning, missile defense, and technical intelligence capabilities. The committee notes that the SBIRS program has had persistent cost, schedule, and technical problems over the last several years of its development. Unexpected technical difficulties on the first SBIRS payload resulted in cost overruns and schedule delays. These problems and further technical difficulties have, in turn, resulted in a delay of at least a year in the first launch of a SBIRS satellite in geostationary orbit.

The committee notes that the Commander, U.S. Strategic Command, in testimony to the Strategic Forces Subcommittee, Committee on Armed Services of the Senate, indicated that continued progress in the SBIRS program "is absolutely essential" to his command, and the Under Secretary of the Air Force testified before the same subcommittee that technical challenges and schedule delays have resulted in a budget shortfall in the SBIRS program.

The committee remains supportive of the SBIRS program because of the critical nature of its mission. The committee recommends an increase of $35.0 million in PE 64441F to help address the SBIRS budget shortfall, overcome development difficulties, and minimize the schedule delay. The committee directs that none of this recommended increase may be obligated or expended until the Secretary of Defense provides to the congressional defense committees a new analysis of alternatives for the early warning mission.

Multi-sensor command and control aircraft

The budget request included $538.9 million in PE 27450F for the multi-sensor command and control aircraft (MC2A), including $333.0 million for the MC2A testbed aircraft. The MC2A has re-

cently been designated the E–10A. The first testbed aircraft was to be delivered for modifications in December 2005, but this delivery has slipped to June 2006, as a result of a re-phasing of efforts after a year delay in the Milestone B decision. The committee recommends a decrease of $40.0 million in PE 27450F since the testbed aircraft will not be available on the schedule projected when the budget request was submitted.

Ballistic missile range safety technology

The budget request included $8.0 million in PE 65860F for the rocket systems launch program, but no funding for ballistic missile range safety technology (BMRST).

The committee recognizes that new technology holds significant promise to improve down range reentry support, increase launch support capability, lower range support costs, and improve range safety. BMRST is based on Global Positioning System signals and an inertial navigation system to track space launch vehicles. Because of its mobility, the system can be used to support launches from the Eastern and Western launch ranges (located at Cape Canaveral and Vandenberg Air Force Base, respectively), as well as others with varying trajectories, such as missile defense launches.

The committee recommends an increase of $15.0 million in PE 65860F for BMRST, to expand system capability, provide downrange reentry support, and expedite full system certification at the Eastern Range.

Rocket systems launch program

The budget request included $8.0 million in PE 65860F for the rocket systems launch program, but no funding for development of small, low-cost launch vehicles.

The committee believes that low-cost, tactically flexible launch alternatives for small payloads of about 200 pounds could provide warfighters with an important quick-reaction option to place militarily useful capabilities in low earth orbit. The committee believes that existing technology should allow a near-term demonstration of such a launch capability.

The committee recommends an increase of $7.5 million in PE 65860F for research, development, and demonstration of a tactically flexible launch vehicle for microsatellites.

A–10 aircraft propulsion improvements

The budget request included $22.6 million in PE 27131F for the continued development of the A–10 aircraft, but included no funding for development of A–10 propulsion improvements. The Air Force intends to operate this aircraft until fiscal year 2028, and aircrews have continued to rank propulsion as a major operational deficiency. The committee recommends an increase of $10.0 million in PE 27131F to begin a propulsion modernization effort for the A–10 aircraft.

F–15C/D aircraft radar upgrade

The budget request included $115.2 million in PE 27134F for development of F–15 squadrons, but did not include funds for continued upgrade of F–15C/D aircraft to the APG–63(V3) configuration.

This configuration would benefit F–15C/D aircraft with significant operational enhancements, while achieving a 500 percent improvement in reliability and an 800 percent reduction in the mobility footprint. This radar upgrade is included as the number one priority on the Air Force Chief of Staff's Unfunded Priority List. The committee recommends an increase of $17.2 million in PE 27134F for development leading to the procurement of the APG–63(V3) radar for F–15C/D aircraft.

The committee recognizes that without radar upgrades such as the APG–63(V3), the F–15 will be unable to effectively perform its primary mission of counterair and homeland defense against cruise missiles and other future airborne threats. The committee expects that the Air Force will include F–15 radar upgrades in future budget requests.

Global positioning system jammer detection and location system

The budget request included $10.7 million in PE 27247F for Air Force tactical exploitation of national capabilities, but no funding for the Global Positioning System Jammer Detection and Location System (JLOC).

The Global Positioning System (GPS) is a navigational satellite system central to U.S. warfighting capabilities. GPS provides signals for accurate navigation, and provides the technical basis for many of the precision guided weapons in the U.S. inventory. GPS satellites, however, transmit very low power signals that are susceptible to jamming.

The JLOC effort is developing a high gain advanced GPS receiver, database, predictive tool, and network interfaces that will provide the operational capability to detect, locate, and predict effects of GPS jamming signals. This capability will enhance situational awareness, mission tasking and mission planning, and help allow the warfighter to disregard, kill, or evade jammers. Flight testing of the system has begun, and the committee is aware of support for JLOC from the operational community. The committee is also aware that additional funds are required to integrate JLOC into space operations, initiate development of an all-source data fusion capability, integrate JLOC into mission planning tools, and initiate development of a JLOC tactical control station.

Therefore, the committee recommends an increase of $5.0 million in PE 27247F for JLOC.

Cybersecurity research

The budget request included $79.6 million in PE 33140F for information systems security research. Cybersecurity and information assurance are critical to national defense and represent a continued vulnerability. Network attacks from terrorists, foreign nations, and domestic hackers could compromise defense operations and endanger lives. The committee recommends an increase in PE 33140F of $5.0 million for cybersecurity research to target vulnerabilities and create the technology base for the next generation of protection mechanisms and architectures.

Information systems security research

The budget request included $79.6 million in PE 33140F, for the Information Systems Security Program.

The committee notes that the nation's military and commercial information systems continue to be vulnerable to attack. While funding for defense information systems security has increased in recent years, the threat to these systems from other nations, terrorist groups, and hackers continues to grow. The committee is particularly aware of homeland security and homeland defense initiatives managed by the Air Force Research Laboratory (AFRL), in conjunction with National Security Agency (NSA) Centers of Excellence. In particular, AFRL, in conjunction with the Air Force Air Intelligence Agency (AIA), has been a leader in the development of improved methods to conduct cybersecurity attack exercises as a research tool and training process. Additionally, these cybersecurity exercises have been instrumental in identifying the legal and policy impediments to coordinating a smooth flow of information between the Department of Defense, federal, state, and local governments and industry. Therefore, the committee recommends an increase of $3.0 million in PE 33140F, for these initiatives.

Global operations center

The budget request included $3.6 million in PE 35150F for research and development on the global command and control system, but no funding for improvements to the global operations center for U.S. Strategic Command.

The committee understands that horizontal integration of data from multiple intelligence, surveillance, and reconnaissance (ISR) sources is a significant priority for the Department of Defense and operational commands. This integration will help provide decision makers and warfighters with the information required for effective command and control. The committee notes that the Commander, U.S. Strategic Command, testified to the Strategic Forces Subcommittee, Committee on Armed Services of the Senate, on the shortfalls in such capability at U.S. Strategic Command. The committee recognizes that U.S. Strategic Command's command and control needs, spanning tactical, theater, and strategic operational levels, are uniquely challenging.

The committee believes that ongoing efforts to develop advanced display technologies can be used to provide U.S. Strategic Command a display system in a timely manner that will integrate multiple ISR sources. The committee recommends an increase of $8.0 million in PE 35150F for a global awareness display system.

Civil reserve space service

The budget request included $17.8 million in PE 35110F for research and development related to the Air Force Satellite Control Network (AFSCN), but no funding for the civil reserve space service (CRSS).

The AFSCN provides tracking, telemetry, and control for U.S. military satellites. The committee notes that the antennas and equipment used for satellite tracking, telemetry and control (TT&C) are aging and increasingly difficult to sustain. Further, the

most recent Air Force analysis forecasts that some AFSCN antennas will operate at 96 percent capacity by 2006, a level that will start to jeopardize the ability of the Air Force to meet both routine and contingency requirements. The committee also notes that the AFSCN modernization program is substantially over budget and behind schedule. The CRSS effort is intended to demonstrate the feasibility of augmenting AFSCN capabilities with commercial satellite control antennas. The committee believes that commercial antennas for TT&C, available to the AFSCN, can provide important surge and contingency capability at modest cost. The committee supports continued test, development, and validation of AFSCN surge and augmentation capabilities.

Therefore, the committee recommends an increase of $3.0 million in PE 35110F to continue research, development, and testing of CRSS.

Space surveillance system

The budget request included $161.8 million in PE 35910F for space surveillance research and development, but no funding for upgrades to the Air Force Space Surveillance System (AFSSS) network of radars.

The AFSSS is a series of radars across the continental United States to detect low earth orbiting objects. The program was formerly managed by the Navy, and was transferred, without any associated out-year funds, to the Air Force in fiscal year 2003. The Navy awarded a contract for AFSSS upgrades in fiscal year 2003, but the funds for this contract have been withheld by the Office of the Secretary of Defense pending the outcome of a program review by the Air Force. The committee is aware that the Air Force believes that the AFSSS has high military value; that the system will reach the end of its useful life by the end of the decade; that the 1960s technology in the AFSSS is not sustainable; and that replacement of aging AFSSS sensors with S-band radars is needed to sustain U.S. space surveillance capabilities. The committee understands that the Air Force is currently defining the requirements for such an upgrade.

The committee notes that without additional funds, the AFSSS upgrades will be significantly delayed. The committee recommends an increase of $10.7 million in PE 35910F to accelerate research and development of the AFSSS S-band upgrade.

Industrial preparedness

The budget request included $38.0 million in PE 78011F for industrial preparedness. Rapid, low-cost, high-quality manufacturing and high production volume quantities of affordable nanomaterials are necessary for the advancement of nanoscience research and transition into capabilities for information assurance, force protection, and countless other applications. These materials are critical components of stronger, lighter-weight armor and composite structures. The committee recommends an increase in PE 78011F of $2.5 million for advanced nanomaterials research for military applications.

The Air Force uses electrically rechargeable batteries to provide auxiliary electric power for a variety of uses, such as when the air-

craft is not operating, for emergency electric energy during operations and for engine starting. The committee recommends an increase in PE 78011F of $2.0 million for process development for an aircraft battery component that would store 50 percent more power per unit weight, cost 25 percent less than current batteries, and would be easily disposable.

Support systems development

The budget request included $50.2 million in PE 78611F for support systems development. The committee recommends an increase in PE 78611F of $5.0 million for modular fuel cell architecture development, which would provide reliable power sources for stationary and mobile forces; and $2.0 million for unmanned autonomous aging aircraft maintenance. This project will develop and demonstrate a teleoperated, modular, reconfigurable robotic device that operates inside fuel tanks of aging aircraft to remove old and apply new coatings.

Defense-wide

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
			RESEARCH, DEVELOPMENT, TEST & EVALUATION, DEFENSE-WIDE			
0400	0601101D8Z	1	IN-HOUSE LABORATORY INDEPENDENT RESEARCH			
0400	0601101E	2	DEFENSE RESEARCH SCIENCES	143,729	7,500	151,229
			Molecular electronics		[2,500]	
			Infectious disease research		[2,000]	
			Nanophotonics systems research		[2,000]	
			Novel energetic materials		[1,000]	
0400	0601103D8Z	3	UNIVERSITY RESEARCH INITIATIVES			
0400	0601105D8Z	4	FORCE HEALTH PROTECTION			
0400	0601108D8Z	5	HIGH ENERGY LASER RESEARCH INITIATIVES			
0400	0601111D8Z	6	GOVERNMENT/INDUSTRY COSPONSORSHIP OF UNIVERSITY RESEARCH		7,000	7,000
			Focus center research program		[7,000]	
0400	0601114D8Z	7	DEFENSE EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEAI	9,590		9,590
0400	0601384BP	8	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM	36,769		36,769
0400	0602227D8Z	9	MEDICAL FREE ELECTRON LASER	9,668	8,000	17,668
			Medical free electron laser		[8,000]	
0400	0602228D8Z	10	HISTORICALLY BLACK COLLEGES AND UNIVERSITIES (HBCU) SCIENCE	14,192		14,192
0400	0602234D8Z	11	LINCOLN LABORATORY RESEARCH PROGRAM	25,441		25,441
0400	0602301E	12	COMPUTING SYSTEMS AND COMMUNICATIONS TECHNOLOGY	342,614		342,614
0400	0602302E	13	EMBEDDED SOFTWARE AND PERVASIVE COMPUTING			
0400	0602383E	14	BIOLOGICAL WARFARE DEFENSE	147,533	3,000	150,533
			Biodefense research		[3,000]	

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
0400	0602384BP	15	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM	104,385	7,900	112,285
			Mustard gas antidote		[3,000]	
			Bioinformatics		[2,000]	
			Chemical agent persistence models		[2,900]	
0400	0602702E	16	TACTICAL TECHNOLOGY	339,175	-25,000	314,175
			SIER		[-4,000]	
			Automated battle management		[-10,000]	
			Novel sensors		[-3,000]	
			HEDlight		[-5,000]	
			Laser star		[-3,000]	
0400	0602712E	17	MATERIALS AND ELECTRONICS TECHNOLOGY	502,044	-23,000	479,044
			Bio-based nanosensors		[2,000]	
			Unjustified growth		[-25,000]	
0400	0602716BR	18	WMD DEFEAT TECHNOLOGY	249,786		249,786
0400	0602717BR	19	WMD DEFENSE TECHNOLOGIES	116,113		116,113
0400	0602787D8Z	20	MEDICAL TECHNOLOGY	10,084	100	10,184
			Pseudofolliculitis Barbae		[100]	
0400	0602890D8Z	21	HIGH ENERGY LASER RESEARCH			
0400	1160401BB	22	SPECIAL OPERATIONS TECHNOLOGY DEVELOPMENT	13,109		13,109
0400	1160407BB	23	SOF MEDICAL TECHNOLOGY DEVELOPMENT	2,162		2,162
0400	0603002D8Z	24	MEDICAL ADVANCED TECHNOLOGY	2,063		2,063
0400	0603104D8Z	25	EXPLOSIVES DEMILITARIZATION TECHNOLOGY			
0400	0603121D8Z	26	SO/LIC ADVANCED DEVELOPMENT	32,682		32,682

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
0400	0603122D8Z	27	COMBATING TERRORISM TECHNOLOGY SUPPORT	46,719	10,000	56,719
			Blast mitigation		[10,000]	
0400	0603160BR	28	COUNTERPROLIFERATION INITIATIVES - PROLIFERATION PREVENTION AN	74,456	5,000	79,456
			Portable radiation search tool		[5,000]	
0400	0603175C	29	BALLISTIC MISSILE DEFENSE TECHNOLOGY	204,320	7,300	211,620
			Massively parallel optical interconnects		[4,000]	
			Radiation hardened CMOS		[3,300]	
0400	0603225D8Z	30	JOINT DOD-DOE MUNITIONS TECHNOLOGY DEVELOPMENT	23,319		23,319
0400	0603232D8Z	31	AUTOMATIC TARGET RECOGNITION			
0400	0603285E	32	ADVANCED AEROSPACE SYSTEMS	361,067	-40,000	321,067
			Unjustified growth		[-25,000]	
			Reduction - Orbital Express project		[-15,000]	
0400	0603384BP	33	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM - ADVANCED DEVELOPM	117,343	9,500	126,843
			Anthrax and plague oral vaccine development		[6,000]	
			Water quality sensors		[3,500]	
0400	0603400D8Z	34	JOINT UNMANNED COMBAT AIR SYSTEMS (J-UCAS) ADVANCED TECHNOLC	284,617		284,617
0400	0603704D8Z	35	SPECIAL TECHNICAL SUPPORT			
0400	0603711BR	36	ARMS CONTROL TECHNOLOGY			

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
0400	0603712S	37	GENERIC LOGISTICS R&D TECHNOLOGY DEMONSTRATIONS	27,542	19,500	47,042
			Ferrite technology		[2,500]	
			Support of legacy systems		[2,000]	
			Multi-purpose airframe support system		[2,500]	
			Vehicle fuel cell program		[7,000]	
			Supply chain surge/shortage		[2,500]	
			Microelectronics testing and technology		[3,000]	
0400	0603716D8Z	38	STRATEGIC ENVIRONMENTAL RESEARCH PROGRAM	56,936		56,936
0400	0603727D8Z	39	JOINT WARFIGHTING PROGRAM	9,936		9,936
0400	0603739E	40	ADVANCED ELECTRONICS TECHNOLOGIES	218,151	-11,000	207,151
			Unjustified growth		[-11,000]	
0400	0603750D8Z	41	ADVANCED CONCEPT TECHNOLOGY DEMONSTRATIONS	213,901	2,000	215,901
			Hardware encryption device		[2,000]	
0400	0603755D8Z	42	HIGH PERFORMANCE COMPUTING MODERNIZATION PROGRAM	186,666	4,000	190,666
			High performance computing visualization		[2,000]	
			Simulation center upgrade		[2,000]	
0400	0603760E	43	COMMAND, CONTROL AND COMMUNICATIONS SYSTEMS	225,784	-11,000	214,784
			Unjustified growth		[-11,000]	
0400	0603762E	44	SENSOR AND GUIDANCE TECHNOLOGY	337,117	-15,000	322,117
			Unjustified growth		[-15,000]	
0400	0603763E	45	MARINE TECHNOLOGY			
0400	0603764E	46	LAND WARFARE TECHNOLOGY	63,121		63,121
0400	0603765E	47	CLASSIFIED DARPA PROGRAMS	238,131		238,131
0400	0603766E	48	NETWORK-CENTRIC WARFARE TECHNOLOGY	125,124		125,124

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
0400	0603769SE	49	DISTRIBUTED LEARNING ADVANCED TECHNOLOGY DEVELOPMENT	13,756		13,756
0400	0603781D8Z	50	SOFTWARE ENGINEERING INSTITUTE	21,599		21,599
0400	0603805S	51	DUAL USE APPLICATION PROGRAMS			
0400	0603826D8Z	52	QUICK REACTION SPECIAL PROJECTS	64,389		64,389
0400	0603832D8Z	53	JOINT WARGAMING SIMULATION MANAGEMENT OFFICE	46,017		46,017
0400	0603924D8Z	54	HIGH ENERGY LASER ADVANCED TECHNOLOGY PROGRAM			
0400	0603942D8Z	55	TECHNOLOGY LINK	1,934		1,934
0400	0605160D8Z	56	COUNTERPROLIFERATION SUPPORT	1,958	6,000	7,958
			Nuclear physical security		[6,000]	
0400	1160402BB	57	SPECIAL OPERATIONS ADVANCED TECHNOLOGY DEVELOPMENT	48,803		48,803
0400	0603228D8Z	58	PHYSICAL SECURITY EQUIPMENT			
0400	0603709D8Z	59	JOINT ROBOTICS PROGRAM	11,771		11,771
0400	0603714D8Z	60	ADVANCED SENSOR APPLICATIONS PROGRAM	17,581		17,581
0400	0603736D8Z	61	CALS INITIATIVE			
0400	0603851D8Z	62	ENVIRONMENTAL SECURITY TECHNICAL CERTIFICATION PROGRAM	32,546	7,700	40,246
			Unexploded ordnance detection using airborne GPR		[4,700]	
			Enhanced techniques for the detection of explosives (ETDE)		[3,000]	
0400	0603869C	63	MEADS CONCEPTS			
0400	0603879C	64	ADVANCED CONCEPTS, EVALUATIONS AND SYSTEMS	256,159		256,159
0400	0603880C	65	BALLISTIC MISSILE DEFENSE SYSTEM SEGMENT			
0400	0603881C	66	BALLISTIC MISSILE DEFENSE TERMINAL DEFENSE SEGMENT	937,748		937,748
			Arrow coproduction (non-additive)		[80,000]	

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
0400	0603882C	67	BALLISTIC MISSILE DEFENSE MIDCOURSE DEFENSE SEGMENT	4,384,775	40,000	4,424,775
			GMD enhancements		[75,000]	
			GMD long lead		[-35,000]	
0400	0603883C	68	BALLISTIC MISSILE DEFENSE BOOST DEFENSE SEGMENT	492,614		492,614
0400	0603884BP	69	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM	104,195		104,195
0400	0603884C	70	BALLISTIC MISSILE DEFENSE SENSORS	591,957	20,000	611,957
			Airborne infrared system		[15,000]	
			E-2C infrared search and track (IRST)		[5,000]	
0400	0603886C	71	BALLISTIC MISSILE DEFENSE SYSTEM INTERCEPTOR	511,262	-200,000	311,262
			Kinetic energy interceptor		[-200,000]	
0400	0603888C	72	BALLISTIC MISSILE DEFENSE TEST & TARGETS	713,658		713,658
0400	0603889C	73	BALLISTIC MISSILE DEFENSE PRODUCTS	418,608	5,000	423,608
			Joint National Integration Center		[5,000]	
0400	0603890C	74	BALLISTIC MISSILE DEFENSE SYSTEMS CORE	479,764	-5,000	474,764
			Corporate lethality program		[-5,000]	
0400	0603910D8Z	75	STRATEGIC CAPABILITY MODERNIZATION			
0400	060xxxxD8Z	75A	Operationally responsive satellite payloads		25,000	25,000
0400	0603920D8Z	76	HUMANITARIAN DEMINING	13,747		13,747
0400	0603923D8Z	77	COALITION WARFARE	5,886		5,886
0400	0604400D8Z	78	JOINT UNMANNED COMBAT AIR SYSTEMS (J-UCAS) ADVANCED COMPONE	422,873		422,873
0400	0604722D8Z	79	JOINT SERVICE EDUCATION AND TRAINING SYSTEMS DEVELOPMENT			
0400	0605017D8Z	80	REDUCTION OF TOTAL OWNERSHIP COST	27,351		27,351
0400	0303191D8Z	81	JOINT ELECTROMAGNETIC TECHNOLOGY (JET) PROGRAM	6,679		6,679

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
0400	0604384BP	82	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM	152,379	7,000	159,379
			JBPDS		[5,000]	
			JSLSCAD		[2,000]	
0400	0604618D8Z	83	MANPADS DEFENSE PROGRAM	14,135		14,135
0400	0604709D8Z	84	JOINT ROBOTICS PROGRAM	13,845		13,845
0400	0604764K	85	ADVANCED IT SERVICES JOINT PROGRAM OFFICE (AITS-JPO)	18,183		18,183
0400	0604771D8Z	86	JOINT TACTICAL INFORMATION DISTRIBUTION SYSTEM (JTIDS)	18,515		18,515
0400	0604861C	87	THEATER HIGH-ALTITUDE AREA DEFENSE SYSTEM - TMD			
0400	0604865C	88	PATRIOT PAC-3 THEATER MISSILE DEFENSE ACQUISITION			
0400	0605013BL	89	INFORMATION TECHNOLOGY DEVELOPMENT	10,683		10,683
0400	0605013D8Z	90	PROTOTYPE ACCOUNTING SYSTEMS			
0400	0605014SE	91	INFORMATION TECHNOLOGY DEVELOPMENT	52,407		52,407
0400	0605015BL	92	INFORMATION TECHNOLOGY DEVELOPMENT-STANDARD PROCUREMENT :	6,690		6,690
0400	0605016D8Z	93	FINANCIAL MANAGEMENT SYSTEM IMPROVEMENTS	94,767		94,767
0400	0303129K	94	DEFENSE MESSAGE SYSTEM	6,623		6,623
0400	0303140K	95	INFORMATION SYSTEMS SECURITY PROGRAM	2,493		2,493
0400	0303141K	96	GLOBAL COMBAT SUPPORT SYSTEM	17,867		17,867
0400	0303158K	97	JOINT COMMAND AND CONTROL PROGRAM (JC2)	3,000		3,000
0400	0305840K	98	ELECTRONIC COMMERCE	3,466		3,466
0400	0305840S	99	ELECTRONIC COMMERCE	2,345		2,345
0400	0901200D8Z	100	BMMP DOMAIN MANAGEMENT AND SYSTEMS INTEGRATION	7,472		7,472
0400	0603704D8Z	101	SPECIAL TECHNICAL SUPPORT	19,274		19,274
0400	0603757D8Z	102	TRAINING TRANSFORMATION (T2)			
0400	0603835D8Z	103	TRANSFORMATION INITIATIVES PROGRAM	9,977		9,977

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
0400	0603858D8Z	104	UNEXPLODED ORDNANCE DETECTION AND CLEARANCE			
0400	0604774D8Z	105	DEFENSE READINESS REPORTING SYSTEM (DRRS)	19,691		19,691
0400	0604875D8Z	106	JOINT SYSTEMS ARCHITECTURE DEVELOPMENT	4,989		4,989
0400	0604943D8Z	107	THERMAL VICAR	7,263		7,263
0400	0605104D8Z	108	TECHNICAL STUDIES, SUPPORT AND ANALYSIS	30,618	-5,000	25,618
			Unjustified growth		[-5,000]	
0400	0605110BR	109	CRITICAL TECHNOLOGY SUPPORT	1,937		1,937
0400	0605114D8Z	110	BLACK LIGHT	21,535		21,535
0400	0605116D8Z	111	GENERAL SUPPORT TO C3I			
0400	0605117D8Z	112	FOREIGN MATERIAL ACQUISITION AND EXPLOITATION	35,572		35,572
0400	0605123D8Z	113	INTERAGENCY EXPORT LICENSE AUTOMATION	5,882		5,882
0400	0605124D8Z	114	DEFENSE TRAVEL SYSTEM	28,508		28,508
0400	0605126J	115	JOINT THEATER AIR AND MISSILE DEFENSE ORGANIZATION	86,409		86,409
0400	0605128D8Z	116	CLASSIFIED PROGRAM USD(P)			
0400	0605130D8Z	117	FOREIGN COMPARATIVE TESTING	35,633		35,633
0400	0605170D8Z	118	SUPPORT TO NETWORKS AND INFORMATION INTEGRATION	11,490	2,200	13,690
			Command Information Superiority Architectures Program		[2,200]	
0400	0605200D8Z	119	GENERAL SUPPORT TO USD (INTELLIGENCE)	4,830		4,830
0400	0605384BP	120	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM	42,652		42,652
0400	0605502BR	121	SMALL BUSINESS INNOVATION RESEARCH			
0400	0605502C	122	SMALL BUSINESS INNOVATIVE RESEARCH - MDA			
0400	0605502D8Z	123	SMALL BUSINESS INNOVATIVE RESEARCH			
0400	0605502E	124	SMALL BUSINESS INNOVATIVE RESEARCH			

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
0400	0605710D8Z	125	CLASSIFIED PROGRAMS - C3I		10,000	10,000
			Foreign Supplier Assessment Center		[10,000]	
0400	0605790D8Z	126	SMALL BUSINESS INNOVATION RESEARCH/CHALLENGE ADMINISTRATION	1,999		1,999
0400	0605798S	127	DEFENSE TECHNOLOGY ANALYSIS	7,279	1,000	8,279
			Global research watch		[1,000]	
0400	0605799D8Z	128	FORCE TRANSFORMATION DIRECTORATE	19,591		19,591
0400	0605801K	129	DEFENSE TECHNICAL INFORMATION SERVICES (DTIC)	45,203		45,203
0400	0605803SE	130	R&D IN SUPPORT OF DOD ENLISTMENT, TESTING AND EVALUATION	10,598		10,598
0400	0605804D8Z	131	DEVELOPMENT TEST AND EVALUATION	8,882		8,882
0400	0605898E	132	MANAGEMENT HQ - R&D	46,689		46,689
0400	0303169D8Z	133	INFORMATION TECHNOLOGY RAPID ACQUISITION	19,958		19,958
0400	0305193D8Z	134	INTELLIGENCE SUPPORT TO INFORMATION OPERATIONS (IO)	12,878		12,878
0400	0305193G	135	INTELLIGENCE SUPPORT TO INFORMATION OPERATIONS (IO)	[ ]		
0400	0901585C	136	PENTAGON RESERVATION	13,884		13,884
0400	0901598C	137	MANAGEMENT HQ - MDA	141,923		141,923
0400	0901598D8W	138	IT SOFTWARE DEV INITIATIVES	1,700		1,700
0400	0909999E	139	FINANCING FOR CANCELLED ACCOUNT ADJUSTMENTS			
0400	0604805D8Z	140	COMMERCIAL OPERATIONS AND SUPPORT SAVINGS INITIATIVE			
0400	0605127T	141	PARTNERSHIP FOR PEACE (PFP) INFORMATION MANAGEMENT SYSTEM	6,995		6,995
0400	0607384BP	142	CHEMICAL AND BIOLOGICAL DEFENSE (OPERATIONAL SYSTEMS DEVELOP	2,178		2,178
0400	0208043J	143	CLASSIFIED PROGRAMS	1,663		1,663
0400	0208045K	144	C4I INTEROPERABILITY	41,074		41,074
0400	0208052J	145	JOINT ANALYTICAL MODEL IMPROVEMENT PROGRAM	5,577		5,577
0400	0300205R	146	INFORMATION TECHNOLOGY SYSTEMS			

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
0400	0301011G	147	CRYPTOLOGIC ACTIVITIES	[ ]		
0400	0301301L	148	GENERAL DEFENSE INTELLIGENCE PROGRAM	[ ]		
0400	0301318BB	149	HUMINT (CONTROLLED)	[ ]		
0400	0301398L	150	MANAGEMENT HEADQUARTERS GDIP, DIA	[ ]		
0400	0301555BB	151	CLASSIFIED PROGRAMS	[ ]		
0400	0301556BB	152	SPECIAL PROGRAM	[ ]		
0400	0302016K	153	NATIONAL MILITARY COMMAND SYSTEM-WIDE SUPPORT	1,240		1,240
0400	0302019K	154	DEFENSE INFO INFRASTRUCTURE ENGINEERING AND INTEGRATION	2,517		2,517
0400	0303126K	155	LONG-HAUL COMMUNICATIONS - DCS	11,401		11,401
0400	0303127K	156	SUPPORT OF THE NATIONAL COMMUNICATIONS SYSTEM			
0400	0303131K	157	MINIMUM ESSENTIAL EMERGENCY COMMUNICATIONS NETWORK (MEECN	7,261		7,261
0400	0303140D8Z	158	INFORMATION SYSTEMS SECURITY PROGRAM	11,135		11,135
0400	0303140G	159	INFORMATION SYSTEMS SECURITY PROGRAM	477,846		477,846
0400	0303149J	160	C4I FOR THE WARRIOR	4,177		4,177
0400	0303149K	161	C4I FOR THE WARRIOR	24,712		24,712
0400	0303150K	162	GLOBAL COMMAND AND CONTROL SYSTEM	43,693		43,693
0400	0303153K	163	JOINT SPECTRUM CENTER	18,941		18,941
0400	0303165K	164	DEFENSE COLLABORATION TOOL SUITE (DCTS)	8,503		8,503
0400	0303170K	165	NET-CENTRIC ENTERPRISE SERVICES (NCES)	52,059		52,059
0400	0303610K	166	TELEPORT PROGRAM	10,272		10,272
0400	0304210BB	167	SPECIAL APPLICATIONS FOR CONTINGENCIES	20,758		20,758
0400	0304345BQ	168	NATIONAL IMAGERY AND MAPPING PROGRAM	[ ]		
0400	0305102BQ	169	DEFENSE IMAGERY AND MAPPING PROGRAM	[ ]		
0400	0305125D8Z	170	CRITICAL INFRASTRUCTURE PROTECTION (CIP)	28,021		28,021

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
0400	0305127BZ	171	FOREIGN COUNTERINTELLIGENCE ACTIVITIES	[ ]		
0400	0305127V	172	FOREIGN COUNTERINTELLIGENCE ACTIVITIES			
0400	0305146BZ	173	DEFENSE JOINT COUNTERINTELLIGENCE PROGRAM (JMIP)	32,939		32,939
0400	0305146D8Z	174	DEFENSE JOINT COUNTERINTELLIGENCE PROGRAM (JMIP)			
0400	0305183L	175	DEFENSE HUMINT PROGRAM (DHIP)	[ ]		
0400	0305190D8Z	176	C3I INTELLIGENCE PROGRAMS			
0400	0305191D8Z	177	TECHNOLOGY DEVELOPMENT			
0400	0305193G	178	INTELLIGENCE SUPPORT TO INFORMATION OPERATIONS (IO)	[ ]		
0400	0305193L	179	INTELLIGENCE SUPPORT TO INFORMATION OPERATIONS (IO)	[ ]		
0400	0305199D8Z	180	NET CENTRICITY	214,222		214,222
0400	0305202G	181	DRAGON U-2 (JMIP)	[ ]		
0400	0305206G	182	AIRBORNE RECONNAISSANCE SYSTEMS	[ ]		
0400	0305207G	183	MANNED RECONNAISSANCE SYSTEMS	[ ]		
0400	0305208BQ	184	DISTRIBUTED COMMON GROUND SYSTEMS	[ ]		
0400	0305208G	185	DISTRIBUTED COMMON GROUND SYSTEMS	[ ]		
0400	0305208L	186	DISTRIBUTED COMMON GROUND SYSTEMS	[ ]		
0400	0305883L	187	HARD AND DEEPLY BURIED TARGET INTEL SUPPORT	[ ]	10,000	10,000
			Enhanced ISR		[10,000]	
0400	0305884L	188	INTELLIGENCE PLANNING AND REVIEW ACTIVITIES	[ ]		
0400	0305885G	189	TACTICAL CRYPTOLOGIC ACTIVITIES	[ ]		
0400	0305889G	190	COUNTERDRUG INTELLIGENCE SUPPORT	[ ]		
0400	0305917D8Z	191	NATIONAL SECURITY SPACE ARCHITECT (NSSA)			
0400	0708011S	192	INDUSTRIAL PREPAREDNESS	11,005	3,000	14,005
			Advanced manufacturing technologies		[3,000]	

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
0400	0708012S	193	LOGISTICS SUPPORT ACTIVITIES	11,389		11,389
0400	0902298J	194	MANAGEMENT HEADQUARTERS (JCS)	22,421		22,421
0400	1001018D8Z	195	NATO JOINT STARS	30,399		30,399
0400	1160279BB	196	SMALL BUSINESS INNOVATIVE RESEARCH/SMALL BUS TECH TRANS PILOT			
0400	1160401BB	197	SPECIAL OPERATIONS TECHNOLOGY DEVELOPMENT			
0400	1160402BB	198	SPECIAL OPERATIONS ADVANCED TECHNOLOGY DEVELOPMENT			
0400	1160404BB	199	SPECIAL OPERATIONS TACTICAL SYSTEMS DEVELOPMENT	311,966	4,900	316,866
			LAW confined space		[4,900]	
0400	1160405BB	200	SPECIAL OPERATIONS INTELLIGENCE SYSTEMS DEVELOPMENT	25,015	5,000	30,015
			Wireless management and control project		[5,000]	
0400	1160407BB	201	SOF MEDICAL TECHNOLOGY DEVELOPMENT			
0400	1160408BB	202	SOF OPERATIONAL ENHANCEMENTS	57,643	4,000	61,643
			Tactical computer system development		[4,000]	
0400	XXXXXXXXX	999	CLASSIFIED PROGRAMS	3,578,082		3,578,082
			Financial information systems		-10,500	-10,500
			Total, RDT&E Defense-Wide	**20,739,837**	**-103,900**	**20,635,937**

Title II-RDT and E

(Dollars in Thousands)

Acct	Account	Line	Program Title	FY2005 Request	Senate Change	Senate Authorized
			OPERATIONAL TEST & EVALUATION, DEFENSE			
0460	0603941D8Z	1	TEST & EVALUATION SCIENCE & TECHNOLOGY	16,295		16,295
0460	0604940D8Z	2	CENTRAL TEST AND EVALUATION INVESTMENT DEV (CTEIP)	123,562	3,000	126,562
			Autonomous unmanned surface vessel		[3,000]	
0460	0605118D8Z	3	OPERATIONAL TEST AND EVALUATION	42,390		42,390
0460	0605131D8Z	4	LIVE FIRE TESTING	10,209	1,000	11,209
			Joint Test and Training Rapid Advanced Capabilities		[1,000]	
0460	0605804D8Z	5	DEVELOPMENT TEST AND EVALUATION	112,679		112,679
			Total, Operational Test & Evaluation, Defense	**305,135**	**4,000**	**309,135**
			TOTAL RDT&E	**67,772,288**	**803,400**	**68,575,688**

DARPA fundamental research

The budget request included $143.7 million in PE 61101E for defense research sciences at the Defense Advanced Research Projects Agency (DARPA). The committee notes that DARPA's commitment to investing in fundamental research should remain strong so that the Department of Defense can continue to develop revolutionary new technologies and avoid technological surprise from potential adversaries. DARPA's basic research programs must also be structured and managed in a manner consistent with the nature of fundamental research and with the style of research typically performed at universities.

The committee recommends an increase in PE 61101E of $7.5 million to push fundamental research in selected disciplines forward for use by applied programs. Of this amount, the committee recommends an increase of $2.5 million for research on molecular electronics; $2.0 million for nanophotonic systems research, $2.0 million for research on the treatment of infectious organisms; and $1.0 million to continue basic research on novel energetic materials for possible military applications.

Basic biological science programs conducted under this account, for example, the Human Assisted Neural Devices (HAND) program, have the potential to significantly improve human health and battlefield effectiveness. Research offers promising solutions for military personnel, veterans, and others seeking treatment for neurological problems caused by trauma and disease. Potential applications in the intricate operation of unmanned devices and equipment would provide for enhanced stand off, robotic capabilities, removing uniformed personnel from danger. The committee supports this, and other efforts, under this basic research account and commends the Department for pursuit of these innovative projects.

Government/industry co-sponsorship of research

The budget request included no funding for government/industry cosponsorship of research. The committee recommends an increase of $7.0 million in PE 61111D8Z for continuation of this partnership, which has a history of advancing the capabilities of weapons systems, radars, missile seekers and information, and communications networks. The program also supports university-based microelectronics research centers that assist in producing technology and in training the next generation of electronics engineers.

Medical free electron laser

The budget request included $9.7 million in PE 62227D8Z for the medical free electron laser (MFEL). The MFEL meets multiple military needs, and has an established track record of productivity through advances in materials science and battlefield medicine. Continued progress in burn therapies; treatment of head trauma; and treatment of vascular, ocular and peripheral nerve, and orthopedic injuries are all essential to the health of the warfighter. The committee recommends an increase in PE 62227D8Z of $8.0 million for the medical free electron laser program.

Biodefense research

The budget request included $147.5 million in PE 62383E, for biological warfare defense. Discovery of underlying marker and identification techniques associated with pathogen detection and remediation remains important in the Department of Defense's overall efforts to counter chemical and biological threats. The committee recommends an increase in PE 62383E of $3.0 million for biological research aimed at development of novel prophylactic and therapeutic approaches, which would increase survival rates during a chemical or biological attack; treat the largest number of people; and treat people who, prior to the introduction of new detection and remediation capabilities, would have died.

Bioinformatics

The budget request included $104.4 million in PE 62384BP for chemical and biological defense program applied research, including efforts to improve chemical and biological defense equipment and material. The committee continues to support Defense Department research in the field of bioinformatics. Molecular-level biological data such as pathogen DNA is essential to combat bioweapons and infectious diseases. The committee understands that the requirement to process extremely large life science data sets, and conduct bio-system and genomic information analysis of pathogens to end-users in the military presents significant challenges. Therefore, the committee recommends an increase of $2.0 million in PE 62384BP for bioinformatics research.

Mustard gas antidote

The budget request included $11.2 million in PE 62384BP for applied research related to the development and application of pharmaceuticals for the prevention and treatment of the toxic effects of nerve, blister, respiratory, and blood agents. The committee recommends an increase of $3.0 million in PE 62384BP for mustard gas antidote research. The committee is aware of research being conducted by the Department of Defense for a mustard gas antidote using signal transduction inhibition antioxidant liposomes (STIMAL), and notes that STIMAL research has demonstrated the ability to substantially reduce or eliminate the affects of a range of chemical and biological weapons.

Verification and validation of chemical agent persistence models

The budget request included $104.4 million in PE 62384BP, for chemical and biological defense applied research, including $27.4 million for supporting science and technology. The committee recommends an increase of $2.9 million to PE 62384BP, for verification and validation of chemical agent persistence models to help protect U.S. forces and permit them to operate effectively in a chemically contaminated environment.

Tactical technologies

The budget request included $339.2 million in PE 62702E for applied research on tactical systems. The committee recommends a total reduction of $25.0 million from this account. The committee

recommends a reduction of $4.0 million from the Stimulated Isomer Energy Release program. The committee agrees with the majority of expert technical opinions that this effort, though carrying a large potential payoff, should be a smaller fundamental research effort at this time. The committee recommends a reduction of $10.0 million for the Automated Battle Management program. It is not clear how this effort is coordinated with ongoing service efforts for network centric warfare or how it is connected to the Department of Defense's Horizontal Fusion program. The committee recommends a reduction of $3.0 million for novel sensors designed for human-animal discrimination systems to maintain a reasonable funding path. The committee recommends a reduction of $5.0 million for the HEDLight program. The committee believes that lighting technology is not the highest priority area of Navy interest, and that the transition success of this effort is questionable. The committee recommends a reduction of $3.0 million for the Laser Star program. The committee believes that a reduced program effort should be maintained until a clear technology transition path for the program is developed.

Biological sensor research

The budget request included $502.0 million in PE 62712E for materials and electronics technology. The committee recommends an increase in PE 62712E of $2.0 million to develop new devices based on nanotechnology for use in defense applications in biological sensing and decontamination.

Materials and electronics applied research

The budget request included $502.0 million in PE 62712E for applied research in materials and electronics technologies. The committee recommends a reduction in PE 62712E of $25.0 million due to unjustified program growth.

General medical research

The budget request included $10.1 million in PE 62787D8Z for medical technology. The committee recommends an increase in PE 62787D8Z of $100,000 for clinical trials and research on a topical treatment for pseudofolliculitis barbae (PFB). The topical treatment under development would quickly yield results, providing relief for those who suffer from the PFB skin condition and accelerating their deployment times.

Blast mitigation program

The budget request included $47.7 million in PE 63122D8Z for Combating Terrorism Technical Support. The committee recommends an increase of $10.0 million in PE 63122D8Z for the blast mitigation program to pursue research and development of technologies to validate and enhance existing and new analytical tools for use by the armed services and homeland defense officials. The committee recognizes the importance of understanding the response of buildings, structures, and housing to explosives and other weapons of mass destruction to improve the protection of our assets.

Portable radiation search tool

The budget request included $74.5 million in PE 63160BR for counterproliferation initiatives-proliferation prevention and defeat efforts, including efforts to demonstrate integrated nuclear warfare protection systems technologies. The committee notes that the Defense Threat Reduction Agency included testing of a portable radiation search tool (PRST) in the congressionally-directed Unconventional Nuclear Warfare Defense pilot program. The PRST, a gamma ray and neutron detector based on fiber optic technology, demonstrated the capability to detect radiological weapons of mass destruction. Therefore, the committee recommends an increase of $5.0 million in PE 63160BR for continued development of the PRST.

Massively parallel optical interconnects

The budget request included $204.3 million in PE 63175C for ballistic missile technology, of which $3.3 million is for microsatellite sensing technology development.

The committee is aware of ongoing Missile Defense Agency research on missile defense applications for microsatellites, and notes that microsatellites will require substantial onboard processing and high signal processing rates to detect and track threat missiles. Continuing research and development on massively parallel electroptical interconnects is intended to enable very high data exchange rates between microsatellite chip sets. The committee understands that additional funds are required to complete this effort.

Therefore, the committee recommends an increase of $4.0 million in PE 63175C for additional development of massively parallel optical interconnects.

Radiation hardened electronics

The budget request included $204.3 million in PE 63175C for ballistic missile technology, but no funding for research and development for radiation hardened complementary metal oxide semiconductors.

The committee understands that strained silicon electronics have demonstrated higher speeds with lower power consumption, and improved gamma ray and x-ray tolerances compared to current silicon chips. The committee notes that high-speed radiation hardened electronics will be valuable in many applications, and that the Missile Defense Agency has sponsored innovative research for this technology in the past. Additional funds are needed to optimize manufacturing processes and improve performance.

The committee recommends an increase of $3.3 million in PE 63175C for radiation hardened complementary metal oxide semiconductors.

Aerospace systems research

The budget request included $361.1 million in PE 63285E for advanced technology development for aerospace systems. The committee recommends a decrease in PE 63285E of $40.0 million due to excessive program growth. Of this amount, the committee recommends a specific reduction of $15.0 million in the Orbital Express project and urges the Department of Defense to examine the

military utility, goals, accomplishments, and technology transition plans for this program.

Anthrax and plague oral vaccine research and development

The budget request included $21.7 million in PE 63384BP for preclinical development of safe and effective prophylaxes and therapies for pre-and post-exposure to biological threat agents, including development of oral vaccines. The committee supports efforts to exploit advanced vaccine technology to develop a single-dose oral vaccine that can protect against multiple biological warfare agents, such as anthrax and plague. Therefore, the committee recommends an increase of $6.0 million in PE 63384BP for the development of an oral vaccine.

Water quality sensors

The budget request included no funding in PE 63384BP for water quality sensors. The committee recommends an increase of $3.5 million in PE 63384BP for the development of a hand held water quality sensing device capable of detecting the presence of chemical, biological, and pollutant agents in drinking water.

Generic logistics research and development technology demonstrations

The budget request included $27.5 million in PE 63712S for generic logistics research and development technology demonstrations. Targeted increases for specific projects would accelerate transition and reduce costs for selected department maintenance operations. The committee recommends an increase in PE 63712S of $19.5 million: $3.0 million for microelectronics testing and technologies; $7.0 million to identify and support technological advances to develop fuel cell technology for use in Department of Defense vehicles; $2.0 million to address diminishing manufacturing source problems, resulting from legacy systems that remain in use but are no longer in production; $2.5 million for ferrite technology, which provides capabilities for modern radar, communications and electronic countermeasure systems; $2.5 million to address supply chain variations; and $2.5 million for a multipurpose airframe support system, which will service legacy vehicles and new aircraft.

Advanced electronics technologies

The budget request included $218.2 million in PE 63739E for the development of advanced electronics technologies. The committee recommends a reduction in PE 63739E of $11.0 million due to excessive program growth in the area of mixed technology integration.

Hardware encryption devices

The budget request included $214.0 million in PE 63750D8Z for the Advanced Concept Technology Demonstrations program. To improve operational security in the event of lost or overrun computer assets, the committee recommends an increase in PE 63750D8Z of $2.0 million for acceleration of hardware encryption devices.

High performance computing

The budget request included $186.7 million in PE 63755D8Z for the high performance computing modernization program, which supports the needs of the warfighter for technological superiority and military dominance on the battlefield by providing advanced computational services to U.S. weapons systems, scientists, and engineers. The committee recommends an increase in PE 63755D8Z of $2.0 million for high performance computing visualization research, which provides synergies between existing organizations and programs that are vital to the advancement of the Department of Defense's mission. The areas addressed in this research—weather forecasting, computational chemistry and nanosensors for bioagent detection, robust distributed data storage, and advanced visualization methods—are essential to the execution of the warfighting mission.

The acquisition community is increasingly reliant on high fidelity simulations to complement live fire testing activities. Simulations also permit engineering evaluation of functions that are not physically tested due to range, environmental, or cost constraints. The committee recommends an increase of $2.0 million for high performance computing simulation upgrades.

Command and control systems

The budget request included $225.8 million in PE 63760E for DARPA command, control, and communications systems research. The committee recommends a decrease in PE 63760E of $11.0 million due to excessive program growth.

Sensors and guidance technologies

The budget request included $337.1 million in PE 63762E for Defense Advanced Research Projects Agency sensor and guidance technology research programs. The committee recommends a decrease in PE 63762E of $15.0 million due to significant program growth over the last three years.

Nuclear physical security

The budget request included $2.0 million in PE 65160D8Z for the nuclear matters program, but no funding for research and development related to nuclear physical security.

The committee notes that in the current national security environment, nuclear weapons face an increased threat of terrorist attack. Although the military services have taken steps to address this threat, the committee does not believe that the research and development to improve the protective infrastructure has kept pace with changing threats. The committee believes that a reinvigorated nuclear physical security research and development program should be established that focuses on new technologies that reinforce the concept of assured denial.

The committee recommends an increase of $6.0 million in PE 65160D8Z for nuclear physical security research and development.

Enhanced techniques for the detection of explosives

The budget request included $32.5 million in PE 63851D8Z for enhanced techniques for the detection of explosives for the Environ-

mental Security Technical Certification Program. The committee recommends an increase of $3.0 million in PE 63851D8Z to continue the Crane Naval Surface Warfare Center project, to improve technologies presently deployed for explosive detection and to deliver faster, more cost-effective, and more reliable detection systems. The committee notes that even the newest equipment suffers from high false alarm rates on all types of explosives, improvised explosive devices, land mines, and unexploded ordnance in different environments. This project addresses a compelling need for developing standoff detection systems employing multiple detectors of different types with the goal of attaining a good detection rate with low false signals.

Unexploded ordnance detection using airborne ground penetrating radar (GPR)

The budget request included $32.5 million in PE 63851D8Z for advanced technology development of the Environmental Security Technical Certification Program. The committee recommends an increase of $4.7 million in PE 63851D8Z for unexploded ordnance detection using airborne ground penetrating radar (GPR). The committee notes that this ongoing program will support the enhancement of GPR by developing the necessary technology to detect unexploded ordnance through foliage.

Arrow ballistic missile defense system

The budget request included $87.4 million in PE 63881C for the Arrow ballistic missile defense system, of which $24.5 million is for the Arrow missile production program.

The committee recognizes the importance of the Arrow system to the defense of U.S. allies and interests in the Middle East, and coproduction of the Arrow missile by Israeli and U.S. industry partners to enhance Arrow production rates. Of the funds authorized for ballistic missile defense, the committee authorizes up to $80.0 million for coproduction of the Arrow ballistic missile defense system.

Ground-based midcourse ballistic missile defense

The budget request included $4.4 billion in PE 63882C for the ballistic missile defense (BMD) midcourse defense segment, of which $3.2 billion is for the ground-based midcourse defense (GMD) element.

Consistent with the requirements of the National Missile Defense Act of 1999 (Public Law 106–38), the committee continues to support fielding of the GMD element as part of the missile defense test bed. The committee notes that the use of the operational capabilities of missile defense test bed has been endorsed in testimony before the committee by both the Commander of U.S. Strategic Command, representing the operational community, and the Director of Operational Test and Evaluation, who oversees Missile Defense Agency testing.

The committee is concerned, however, that the capability to conduct tests of the GMD element concurrently with GMD operations is not yet robust. The committee recognizes that effective concurrent test and operation will depend on several factors: development

of a good concept of operations; extensive coordination between the system developer, the developer of the system concept of operations, and the system operator; sufficient redundancy in activated assets to avoid extended periods during which either test or operation would be unduly inhibited; interoperability of test assets with activated assets; and sufficient personnel to support concurrent test and operation. The committee understands that GMD element capabilities will improve over time as GMD components mature, but is concerned that in the near-term, some technical aspects of the GMD element may lack the redundancy to support concurrent test and operation as effectively as would be desired.

The committee also believes that effective test and operation of the GMD system will require sufficient funds to sustain the test bed, including acquisition of spare parts and logistics support. The committee understands that additional sustainment funds are needed to provide higher assurance that test and operational requirements can be met.

The committee recommends an increase of $75.0 million for the GMD element for: (1) software upgrades; additional system components; development of procedures, protocols, and concepts of operations; and testing to improve concurrent test and operations capabilities of the GMD; (2)additional spare parts and logistics support to improve GMD sustainability; and (3) additional risk reduction and testing.

The committee notes that $493.3 million of the GMD budget request is to acquire 10 additional interceptors, kill vehicles, and silos in fiscal year 2005 and $35.0 million for long lead items for another 10 missiles to be acquired in fiscal year 2006 potentially to be fielded at a third GMD site. The committee recognizes that the operational capabilities of the missile defense test bed are enhanced by additional interceptors. The committee also understands that these interceptors will provide valuable test data, either through life cycle and ground testing or launch during the test program. The committee notes, however, that no third GMD site has been identified. The committee believes that acquisition of long lead items for additional missiles is premature and that this funding is more appropriately realigned to support concurrent test and operations and GMD sustainment. The committee recommends no funding for long lead items for additional GMD interceptor missiles.

Overall, the committee recommends $3.2 billion in PE 63882C for the ground-based midcourse defense element, an increase of $40.0 million.

Airborne infrared system

The budget request included $592.0 million in PE 63884C for ballistic missile defense sensors, but no funding for the airborne infrared system (AIRS).

AIRS is a system of infrared and visible sensors, a surveillance radar, and adjunct data processing and storage that can track ballistic missiles and their warheads in all phases of flight. Early versions of the system are mounted on aircraft (the High Altitude Observatory or HALO and HALO II), but with incremental and evolutionary development, could be deployed on a variety of plat-

forms, including the Global Hawk unmanned aerial vehicle and potentially, the High Altitude Airship being developed by the Missile Defense Agency (MDA). HALO and HALO II have already provided valuable data on infrared signatures of ballistic missiles. The committee believes that an improved system, if and when deployed, could provide important test, operational, and technical intelligence capabilities in support of ballistic missile defense.

Therefore, the committee recommends an increase of $15.0 million in PE 63884C for AIRS research and development. This increase will allow MDA to proceed with engineering development for system connectivity, a closed loop fire control system, and an AIRS prototype system for manned or unmanned air vehicles.

E–2 infrared search and track

The budget request included $592.0 million in PE 63884C for ballistic missile defense sensors, but no funding for infrared search and track technology for the Navy's E–2 tactical warning and command and control aircraft.

The Navy has conducted testing of a turreted infrared search and track (IRST) system on the Navy's E–2's tactical warning and command and control aircraft that successfully demonstrated the potential for such a system to receive cues, and then detect and track short and medium range ballistic missiles. A more capable system, that includes fixed infrared arrays and a turret, shows high potential for a robust capability to detect and track these missile threats early in flight through midcourse trajectory and to provide accurate impact point prediction.

Therefore, the committee recommends an increase of $5.0 million in PE 63884C for flight testing and continued development of the E–2 IRST project.

Kinetic energy interceptor

The budget request included $511.3 million in PE 63886C for ballistic missile defense system (BMDS) kinetic energy interceptors (KEI). The committee notes that this request represents an increase of about 350 percent compared to fiscal year 2004 appropriations.

The BMDS interceptor development program seeks to develop by 2010 a ground-based BMD system to intercept threat missiles in their boost phase, shortly after takeoff. To achieve this schedule, the program will combine relatively mature component technologies with an advanced interceptor missile. The ground-based system will then serve as the basis for a sea-based follow-on system.

The committee notes that the concept of operations for a kinetic energy boost phase system requires that the interceptors be deployed relatively close to the launch sites. Consequently, against some potential adversaries, ground-based boost phase intercept is not a viable alternative. To defend against threats from other potential adversaries, multiple ground-based KEI sites would be required. The committee believes that a concept of operations based on permanent KEI deployment in multiple sites contiguous with a potential adversary or multiple emergency deployments in volatile regions is at best problematic.

The committee recognizes that an advanced KEI interceptor could be used to upgrade the current ground-based midcourse defense element. The committee further believes that a sea-based BMD system that provides boost, midcourse, and terminal defense could be valuable to defend both the United States and its allies and friends in a variety of contingencies.

The committee recommends a decrease of $200.0 million in PE 63886C for KEI. The committee notes that the recommended funding represents an increase compared to the fiscal year 2004 funding level of about 175 percent, sufficient to pursue an aggressive program. The committee recommends that the funds available be used to continue interceptor development, sea-basing, and sea-based concepts of operations.

The committee notes that the Missile Defense Agency intends to conduct a test of the near field infrared experiment (NFIRE) that will likely result in a collision between the target missile and the NFIRE spaceborne sensor. The committee is concerned that effects of the space debris from such an impact are not well enough understood. The committee directs that this test, if it proceeds as planned, be conducted in such a manner as to prevent an impact. The committee directs the Director of the Missile Defense Agency to provide the congressional defense committees a report no later than March 15, 2005, on the risks to space assets posed by debris that would result from an impact between the NFIRE sensor and a target missile. The committee urges the Missile Defense Agency to explore cost-effective alternatives for collecting near-field data on missile plumes.

Joint national integration center

The budget request included $418.6 million in PE 63889C for ballistic missile defense products.

The committee recognizes the growing threat posed by ballistic missiles to U.S. allies and friends overseas, and supports efforts by the Department of Defense to more fully engage international partners in the effort to develop and deploy effective ballistic missile defenses. The committee believes that involvement of allies and friends in exercises and modeling and simulation can play a useful role in encouraging international participation in these development efforts. The Joint National Integration Center (JNIC) is the Missile Defense Agency's primary modeling and simulation center. JNIC's integrated system test capability will be important to assuring that ballistic missile defense (BMD) systems are effective against a full range of threats to the United States, deployed U.S. forces, and U.S. allies and friends.

The committee recommends an increase of $5.0 million in PE 63889C for JNIC support of international missile defense events and activities. The committee expects that this increase will enhance exploration of the full range of policy, operational and technical considerations related to international BMD cooperation.

Ballistic missile defense lethality testing

The budget request included a total of $479.8 million in PE 63890C for ballistic missile defense (BMD) system core activities, which provides resources to define and integrate the BMD system.

Of this amount, $19.2 million was requested for lethality testing and analysis, an increase of $4.0 million compared to fiscal year 2004 funding and approximately triple the amount authorized for this purpose in fiscal year 2003. The committee believes that these increases are excessive, and recommends a decrease of $5.0 million in PE 63890C for the corporate lethality program.

Joint Biological Point Detection System

The budget request included $8.6 million in PE 64384BP for the Joint Biological Point Detection System (JBPDS), a modular biological detection suite integrated onto service platforms. The committee recommends an increase of $5.0 million to provide continued product improvement and enhancement of the capabilities of JBPDS. The JBPDS is the first joint service product that provides continuous, rapid fully-automated detection, collection, identification, warning, and sample isolation of Biological Warfare Agents (BWA).

Joint Service Lightweight Standoff Chemical Agent Detector

The budget request included $20.0 million in PE 64384BP for the Joint Service Lightweight Standoff Chemical Agent Detector (JSLSCAD), which detects chemical agents at distances up to five kilometers in stand-alone variants. The JSLSCAD also provides real-time detection of chemical agents in moving vehicle-mounted variants. The committee recommends an increase of $2.0 million to support additional modeling and simulation efforts to increase capability in the fielded increment 1 systems.

Technical studies support and analysis

The budget request included $30.6 million in PE 65104D8Z for technical studies support and analysis. The committee recommends a decrease in PE 65104D8Z of $5.0 million and encourages programs which require studies to provide funding for conducting examinations of selected projects and initiatives.

Command Information Superiority Architectures Program

The budget request included $5.2 million in PE 65170D8Z for the Command Information Superiority Architectures (CISA) Program. This program focuses on developing net-centric transition plans and architectures for the combatant commands. The amount provided in the budget request will provide for architecture models at two of the combatant commands (Joint Forces Command and United States Strategic Command) that will be used to guide the net-centric transition in future fiscal years. The research, development, test, and evaluation funds will be used to finalize the development of the Net-centric Operations and Warfare Reference Model that will be used throughout the Department of Defense in the development of systems and capabilities that support Net-centric Warfare and Operations. Additional funds are needed to expand this architecture program to the other combatant commands. The committee recommends an increase of $2.2 million in PE 65170D8Z for CISA to accelerate this program.

Foreign supplier assessment center

The budget request included $35.6 million in Research, Development, Test and Evaluation, Defense-wide, for foreign comparative testing, but did not include funding for the Foreign Supplier Assessment Center (FSAC) concept which was initiated in 2004, after the submission of the fiscal year 2005 budget request.

The FSAC concept was established to assess potential foreign suppliers wanting to provide products and services, including components for weapon systems, automation hardware, and various forms of software to the Department of Defense. The FSAC will fulfill a critical need to identify and categorize potential foreign suppliers; conduct tests and evaluation of products and services for appropriate security purposes; and develop recommendations and risk mitigation plans.

The committee recommends an increase of $10.0 million in PE 65710D8Z, for the continued development and sustainment of the FSAC concept.

Global Research Watch

The budget request included $7.3 million in PE 65798S for Defense Technology Analysis. The committee recommends an increase in PE 65798S of $1.0 million to support the activities of the Global Research Watch program established in Section 231 of the National Defense Authorization Act for Fiscal Year 2004. The committee believes that better information on international research capabilities will be invaluable as the Department of Defense develops its own research portfolio. Knowledge of coalition partner's and potential adversary's scientific capabilities will inform efforts to establish effective defense technology partnerships, as well as to anticipate the emerging technological threats of the future.

Intelligence support for hard and deeply buried targets

The committee recognizes that HDBTs are increasingly used by U.S. adversaries to conceal and protect valued military assets, such as command and control facilities, missiles, and weapons of mass destruction facilities. The committee understands that intelligence, surveillance, and reconnaissance (ISR) will play a key role in detecting and characterizing HDBTs and in identifying their vulnerabilities. The committee believes that additional focus on information-sharing and persistent and intrusive multi-sensor ISR is needed to support efforts to defeat HDBTs.

The committee recommends an increase of $10.0 million in PE 35883L for intelligence support for hard and deeply buried targets.

Advanced manufacturing technologies

The budget request included $11.0 million in PE 78011S for industrial preparedness. The committee recommends an increase in PE 78011S of $3.0 million for advanced manufacturing technologies focused on sensor development, energy products, materials, and steel and pharmaceutical processing.

Lightweight anti-armor weapon-confined space

The budget request included $312.0 million in Research, Development, Test and Evaluation, Defense-wide, for Special Operations

Forces (SOF), Tactical Systems Development, but did not include funding to complete development of the lightweight anti-armor weapon-confined space (LAW–CS).

The LAW–CS is a recoilless anti-armor and breaching weapon designed to be used in urban areas and confined spaces without causing harm to the operator. The current M72A7 LAW system has several safety issues that will be corrected by the LAW–CS. Additional research and development funding will complete the integration, testing, and certification of the LAW–CS, and enable production and fielding of the LAW–CS to special operations forces. Completion of the development of the LAW–CS is one of the highest priorities of the Commander, U.S. Special Operations Command, for additional funding.

The committee recommends an increase of $4.9 million in PE 116404BB, to complete development of the LAW–CS system.

Special operations wireless management and control project

The budget request included $25.0 million in Research, Development, Test and Evaluation, Defense-wide, for Special Operations Intelligence Systems Development, but included no funding to develop new capabilities for the Joint Threat Warning System (JTWS) as threats evolve.

The special operations wireless management and control project will develop capabilities that can be integrated into the JTWS that will provide special operations forces with tactical capabilities to maintain situational awareness of the wireless communications environment being used by potential adversaries.

The committee recommends an increase of $5.0 million in PE 116405BB, to begin development of a wireless management and control capability for the JTWS.

Tactical computer system development

The budget request included $57.6 million in Research, Development, Test and Evaluation, Defense-wide, for Special Operations Forces (SOF), Operational Enhancements, but did not include funding to develop additional capabilities to be integrated into existing personal tactical computer systems.

Small, ruggedized personal data assistants have been developed and are being fielded to SOF. Additional capabilities for integration onto these devices can be developed, such as range finders, air and maritime navigation, and small video cameras, that will further enhance the functionality and value of these systems to SOF operators.

The committee recommends an increase of $4.0 million in PE 116408BB, to develop additional capabilities for integration into SOF personal tactical computer systems.

Autonomous unmanned surface vessel

The budget request included $123.6 million in PE 64940D8Z for central test and evaluation investment development activities. The committee recommends an increase in PE 64940D8Z of $3.0 million for testing of the autonomous unmanned surface vessel under development for use as a cost-effective, high endurance, intelligence, surveillance, and reconnaissance system.

Joint test and training rapid advanced capabilities

The budget request included $10.2 million in PE 65131D8Z for live fire testing. The committee recommends an increase in PE 65131D8Z of $1.0 million for joint test and training rapid advanced technology. Increased efforts in test and training capabilities improve readiness, reduce casualities, and enhance mission success in combat situations.

Items of Special Interest

Defense Advanced Research Projects Agency Strategic Plan Review

The National Defense Authorization Act for Fiscal Year 2004 contained a provision (section 232) that requires the preparation of a biennial strategic plan for the activities of the Defense Advance Research Projects Agency (DARPA). The Act also directed the Secretary of Defense to establish an appropriate means for review and approval of the DARPA strategic plan. The first biennial strategic plan required by the Act is due with the fiscal year 2006 budget request in February 2005.

As DARPA works to develop the strategic plan, the committee urges the Secretary of Defense to institute a review process, consisting of internal and external advisors for approval of the plan. A group of Department of Defense technical experts, procurement executives, senior military officers, and representatives from the Department's intelligence community, led by the Director, Defense Research and Engineering and working in concert with highly regarded non-Department scientific leaders and private sector managers of large research and scientific enterprises, would add great value to DARPA's planning process and ensure program value and accelerated technology transition.

The strategic plan review should provide DARPA and Department leadership with critical advice to assist in the pursuit of DARPA's important and unique mission. The review group should also provide a fundamental service in identifying changes and policy challenges presented by rapid technological innovation. The review panel could use the opportunity presented by development of the strategic plan to foster close coordination between DARPA and the services, to ensure transition of technologies that meet requirements, to provide consistency of vision and budgeting as program managers serve their terms, and to closely coordinate DARPA efforts with an increasing number of multidisciplinary scientific endeavors, such as information technology, human systems integration, energy and power, and unmanned systems.

The committee directs the Secretary to submit details of the Department's review process with DARPA's strategic plan and the fiscal year 2006 budget request.

Energy and power technologies

The committee notes that energy and power technologies are a key enabler of military activity. Development of compact, rugged, cost-effective power sources, which are deployable in forms that support all of the various missions of the Department of Defense, is a component of force transformation and supports new

warfighting capabilities. The committee notes that the Director of Defense Research and Engineering (DDRE) has initiated the Energy and Power Technology Initiative, a comprehensive, Department-wide effort to explore capability-enabling power technologies.

The committee directs the DDRE to submit a report to the congressional defense committees outlining the goals of the Energy and Power Technology Initiative. The report should include: details of coordination efforts with ongoing projects within the department, with other federal departments and agencies, and with the private sector; technology transition strategies; information on program elements and projects included in the initiative; and future years' investment plans for programs in the initiative. The report should also include an assessment of the military value of various power technologies being explored for applications to light and heavy duty vehicles, weapons, aircraft and unmanned systems, ships, dismounted units, and stationary, and mobile power production facilities.

Future medical shelter systems

The committee understands that the Army Medical Research and Materiel Command is developing a Future Medical Shelter System to replace current systems, including deployable operating rooms that will have decreased size and weight and increased capability. These new shelters will result in a lighter, more mobile and deployable medical force. The committee expects the Army to continue development of systems that can meet the requirements of the future force and provide needed mobile medical services.

Integration of science and technology planning with defense intelligence community requirements

The committee commends the Department of Defense's pilot program to integrate the defense intelligence community into the Department's science and technology (S&T) planning process. The pilot is designed to ensure that the Department is able to identify and respond to foreign S&T programs that could potentially defeat or diminish U.S. military capabilities in the near-term and into the future. The technology community relies on information from the intelligence community to prevent technological surprise and to advance needed technologies. The current S&T planning process does not explicitly address foreign threats, yet technological surprise from this area poses a serious danger to U.S. forces. The committee supports the Department's effort to improve integration between the defense S&T and defense intelligence communities, and directs the Department to submit a progress report to the congressional defense committees on the integration program and its impact on the S&T planning process by January 1, 2005.

Joint Tactical Radio System logistics waveform

The Joint Tactical Radio System (JTRS) program will provide software programmable, reconfigurable digital radio systems to meet Joint Vision 2020 requirements for interoperability, flexibility, adaptability, and information exchange. The program is currently developing more than 100 waveforms as part of this initiative. Although these waveforms will be integrated into JTRS, they

will be tested for functionality separately, a time consuming and relatively expensive process. The committee believes that a different approach should be taken, such as a logistics waveform. A logistics waveform is a test waveform that would travel through the JTRS, similar to an information-transmitting waveform, ensuring that all JTRS components are working properly. The committee believes that the Department of Defense should investigate the feasibility and advisability of using a single logistics waveform or a small series of logistics waveforms to test the functionality of all JTRS waveforms to reduce time and costs. The committee directs the Secretary of Defense to conduct a study of the feasibility and advisability of using logistics waveforms as part of the JTRS test strategy for the JTRS program. The study will determine the feasibility and advisability of using a single logistics waveform or a small series of logistics waveforms for readiness and maintenance testing. The Secretary will submit a report on the results of the study to the congressional defense committees with the submission of the fiscal year 2006 President's budget request.

Management of hard and deeply buried target program efforts

The committee understands that a complex, broad, and multifaceted effort is required to achieve the capability to physically or functionally defeat hard and deeply buried targets (HDBTs). The effort to deploy systems to defeat HDBTs is coordinated by the Office of the Secretary of Defense (OSD) and takes advantage of a large number of ongoing research and development and procurement efforts that have counter-HDBT capabilities. The committee believes that this approach has been cost-effective to date. The committee also believes that this coordination could be improved with the creation of a dedicated program element and a management structure within OSD that would have the resources to conduct more extensive and disciplined analyses of alternatives, integration, and trade studies and the authority to encourage service efforts important to the HDBT effort. The committee urges the Secretary of Defense to consider these steps for fiscal year 2006.

Manufacturing technology

The committee notes that manufacturing has played a vital role in the development and production of national security systems. The globalization of the manufacturing industry, defense industry consolidation, and rapid technological changes have taken their toll on the national defense manufacturing base. The committee believes that a renewed emphasis on developing transformational breakthroughs in manufacturing technologies and processes would aid in the preservation of the manufacturing base, help reduce the cost of weapons systems, improve the nation's global economic competitiveness, and reduce fielding times for new systems.

The committee directs the Director of Defense Research and Engineering to consider establishing a memorandum of agreement between the Defense Advanced Research Projects Agency and the Joint Defense ManTech Panel to identify, develop, and deploy transformational manufacturing technologies and processes that are required to help meet future force requirements. The agree-

ment would accelerate the transition of revolutionary technologies developed by the Defense Advanced Research Projects Agency (DARPA) into the defense industrial base, and would ensure that revolutionary manufacturing technologies and research programs receive focused and coordinated management.

The committee also directs the Director of Defense Research and Engineering to consider establishing and funding a separate science and technology program element for the development of transformational manufacturing technologies as a component of the existing Manufacturing Technology program. The joint cross-service program would be managed by the Joint Defense ManTech Panel, thereby increasing the effectiveness of the individual service and Defense Logistics Agency ManTech programs by establishing a new effort on synergistic, transformational manufacturing technologies, processes, and technology testbeds that would best support the development of joint warfighting capabilities. Existing service-specific manufacturing technology programs would continue their focused efforts and support for the tailored demands of their service partners.

Maximizing technology in urban combat operations

Over the past decade, U.S. forces have been involved in numerous operations that have taken place in urban areas. The lessons learned from these operations, including Operation Iraqi Freedom (OIF), suggest that U.S. forces could benefit from technological advances relevant to combat in an urban environment. The committee is particularly interested in technology that could help counter threats such as the employment of improvised explosive devices (IEDs).

While the committee is aware that the Department of Defense is developing future technologies to improve operational capabilities in urban environments, the committee believes that the Department must increase its efforts to ensure that the military services employ all available sensor-based assets to the maximum extent possible to acquire, identify, and defeat IEDs. The military services must work closely to provide one another the assets to provide flexible solutions to maximize counter IED capabilities. The Department is encouraged to increase its efforts to identify counter IED technology and to deploy any asset available in the Department to counter the IED threat.

Patriot report

The committee notes that during Operation Iraqi Freedom, the Patriot air and missile defense system successfully intercepted nine Iraqi ballistic missiles, but was also involved in several friendly fire incidents. The committee understands that the technical analysis on the causes of the friendly fire incidents has been completed, but that a report on this analysis has not been issued to Congress.

The committee notes that section 1202 of the National Defense Authorization Act for Fiscal Year 2004 (Public Law 108–136) requires a report by the Secretary of Defense on the conduct of Operation Iraqi Freedom. The required report must include a discussion of the accomplishments and shortcomings of major items of U.S. military equipment and weapons systems, incidence of accidental

fratricide, and near- and long-term corrective actions to address identified shortcomings. The committee expects that the Secretary will include a description of the technical analysis on the causes of and corrective actions related to the Patriot friendly fire incidents as part of the report required by section 1202.

Space-based radar

The budget request included $327.7 million in PE 63858F for the space-based radar (SBR) program. The committee recommends the requested amount.

The committee recognizes the benefits of persistent surveillance and the key role of a space-based radar system to provide all-weather, day/night capabilities in an architecture that provides such persistence. The committee remains strongly supportive of the SBR program.

The committee is aware that the cost estimated for the notional SBR architecture selected by the Air Force is substantially higher than the cost of any other U.S. satellite system. The committee recognizes that this estimate is preliminary and contingent on the selection of an SBR architecture and technologies. Nevertheless, the estimate raises concern about the ultimate affordability of an SBR system.

Consequently, the committee believes that the SBR development will require the Air Force and the SBR contractors to put a premium on innovative technical and architectural concepts to produce an affordable system. The committee commends the Air Force for revising the acquisition strategy for SBR to accommodate two contractors and multiple concepts in the early phases of the program. The committee notes, however, that the acquisition strategy calls for the contractors to select their most promising alternative shortly after the contract award. The committee is concerned that a premature down-select will limit the innovation needed in this effort. The committee strongly encourages the Department of Defense Executive Agent for Space to ensure that the acquisition strategy offers the best possibility for innovation and to consider affordability as a key independent criterion on which to judge competing SBR proposals.

Study of joint strike fighter refueling system

The joint strike fighter (JSF) aircraft is in the systems development and demonstration phase. The JSF represents a family of three variants: (1) the conventional takeoff and landing (CTOL) variant for the Air Force; (2) the aircraft carrier (CV) variant for the Navy; and (3) the short takeoff and vertical landing (STOVL) variant for the Marine Corps.

U.S. tactical aircraft use two different methods of refueling. Air Force tactical aircraft are fueled by a boom that extends from the tanker and is guided into a receptacle. Navy and Marine Corps tactical aircraft use a probe that extends from the aircraft to receive fuel from a drogue that the tanker extends on a hose. Tactical aircraft from other countries also use the probe and drogue method.

The JSF program claims to maximize commonality among its family of variants. The committee is interested in why this commonality did not extend to the refueling system for the family of

JSF variants. The committee directs the Comptroller General (U.S.) to submit a report by February 1, 2005, which: (1) examines the rationale behind the decision of the Air Force to retain the boom method of refueling the CTOL JSF; (2) determines the savings, if any, if the Air Force were to decide to change to the probe and drogue method of refueling the CTOL JSF; and (3) determines what operational advantages or disadvantages, if any, would result if the Air Force were to decide to change to the probe and drogue method of refueling the CTOL JSF.